

# Module Handbook Industrial Engineering and Management B.Sc.

SPO 2015

Winter term 2024/25

Date: 07/10/2024

KIT DEPARTMENT OF ECONOMICS AND MANAGEMENT



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## 1 General information

Welcome to the new module handbook of your study program! We are delighted that you have decided to study at the KIT Department of Economics and Management and wish you a good start into the new semester! In the following we would like to give you a short introduction to the most important terms and rules that are important in connection with the choice of modules, courses and examinations.

### 1.1 Structural elements

The program exists of several **subjects** (e.g. business administration, economics, operations research). Every subject is split into **modules** and every module itself consists of one or more interrelated **module component exams**. The extent of every module is indicated by credit points (CP), which will be credited after the successful completion of the module. Some of the modules are **obligatory**. According to the interdisciplinary character of the program, a great variety of **individual specialization and deepening possibilities** exists for a large number of modules. This enables the student to customize content and time schedule of the program according to personal needs, interest and job perspective. The **module handbook** describes the modules belonging to the program. It describes particularly:

- the structure of the modules
- the extent (in CP),
- the dependencies of the modules,
- the learning outcomes,
- the assessment and examinations.

The module handbook serves as a necessary orientation and as a helpful guide throughout the studies. The module handbook does not replace the **course catalog**, which provides important information concerning each semester and variable course details (e.g. time and location of the course).

### 1.2 Begin and completion of a module

Each module and each examination can only be selected once. The decision on the assignment of an examination to a module (if, for example, an examination in several modules is selectable) is made by the student at the moment when he / she is registered for the appropriate examination. A module is completed or passed when the module examination is passed (grade 4.0 or better). For modules in which the module examination is carried out over several partial examinations, the following applies: The module is completed when all necessary module partial examinations have been passed. In the case of modules which offer alternative partial examinations, the module examination is concluded with the examination with which the required total credit points are reached or exceeded. The module grade, however, is combined with the weight of the predefined credit points for the module in the overall grade calculation.

### 1.3 Module versions

It is not uncommon for modules to be revised due to, for example, new courses or cancelled examinations. As a rule, a new module version is created, which applies to all students who are new to the module. On the other hand, students who have already started the module enjoy confidence and remain in the old module version. These students can complete the module on the same conditions as at the beginning of the module (exceptions are regulated by the examination committee). The date of the student's "binding declaration" on the choice of the module in the sense of §5(2) of the Study and Examination Regulation is decisive. This binding declaration is made by registering for the first examination in this module.

In the module handbook, all modules are presented in their current version. The version number is given in the module description. Older module versions can be accessed via the previous module handbooks in the archive at [http://www.wiwi.kit.edu/Archiv\\_MHB.php](http://www.wiwi.kit.edu/Archiv_MHB.php).

### 1.4 General and partial examinations

Module examinations can be either taken in a general examination or in partial examinations. If the module examination is offered as a general examination, the entire learning content of the module will be examined in a single examination. If the module examination is subdivided into partial examinations, the content of each course will be examined in corresponding partial examinations. Registration for examinations can be done online at the campus management portal. The following functions can be accessed on <https://campus.studium.kit.edu/>:

- Register/unregister for examinations
- Check for examination results
- Create transcript of records

For further and more detailed information, see <https://campus.studium.kit.edu/faq.php>.

## 1.5 Types of examinations

Examinations are split into written examinations, oral examinations and alternative exam assessments ("Prüfungsleistungen anderer Art"). Examinations are always graded. Non exam assessments ("Studienleistungen") can be repeated several times and are not graded.

## 1.6 Repeating examinations

Principally, a failed written exam, oral exam or alternative exam assessment can be repeated only once. If the repeat examination (including an eventually provided verbal repeat examination) will be failed as well, the examination claim is lost. A request for a second repetition has to be made in written form to the examination committee two months after losing the examination claim. For further information see <http://www.wiwi.kit.edu/hinweiseZweitwdh.php>.

## 1.7 Examiners

The examination committee has appointed the KIT examiners and lecturers listed in the module handbook for the modules and their courses as examiners for the courses they offer.

## 1.8 Additional accomplishments

Additional accomplishments are voluntarily taken exams, which have no impact on the overall grade of the student and can take place on the level of single courses or on entire modules. It is also mandatory to declare an additional accomplishment as such at the time of registration for an exam. Additional accomplishments with at most 30 CP may appear additionally in the certificate.

## 1.9 Further information

For current information about studying at the KIT Department of Economics and Management, please visit our website [www.wiwi.kit.edu](http://www.wiwi.kit.edu) as well as [Instagram](#), [LinkedIn](#), and [YouTube](#). Please also see current notices and announcements for students at: <https://www.wiwi.kit.edu/studium.php>.

Information around the legal and official framework of the study program can be found in the respective study and examination regulations of your study program. These are available under the Official Announcements of KIT (<http://www.sle.kit.edu/amtlicheBekanntmachungen.php>).

More detailed information about the legal and general conditions of the program can be found in the examination regulation of the program (<http://www.sle.kit.edu/amtlicheBekanntmachungen.php>).

## 1.10 Contact

If you have any questions about modules or exams, please contact the examination office of the KIT Department of Economics and Management:

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## 2 Study plan

The Bachelor's degree program in Industrial Engineering and Management entails a six-semester standard study period. The basic program in the first three semesters is systematically structured. In the fourth to fifth semesters, a more advanced, specialization program that can be structured depending on one's personal interests and goals is offered.

Figure 2 shows the course and module structure with the respective credit points as well as an example of a possible distribution of modules and courses in the basic program over the semesters, which has proven to be useful.

	Term	Credits	Business Administration	Economics	Informatics	Operations Research	Engineering	Statistics	Mathematics	Electives	Internship Bachelor Thesis
Basic Program	1 (WT)	28	Management and Marketing 5 LP	ECON 1 5 CP	PROG 1 5 CP		Mat. Science (MS) 1 3 CP		MATH 1 10 CP		
	2 (ST)	34	Financing and Accounting 5 LP	ECON 2 5 CP	INFO 1 5 CP	OR 9 LP	Eng. Mech. (EM) 1 3 CP	STAT 1 5 CP	MATH 2 7 CP		
	3 (WT)	30	Production, Logistics and Inf. Systems 5 CP		INFO 2 5 CP		Electr. Eng. 1 3 CP	STAT 2 5 CP	MATH 3 4 CP		
					AFoE 3 CP						
Specialization Program	4 (ST)	30		ECON 9 CP	INFO 9 CP	OR 9 CP				Seminar 3 CP	Internship 10 CP
	5 (WT)	28,5	BUS 9 CP				ENG 9 CP			2 Elective Modules (one from BUS/ENG)	
	6 (ST)	29,5								9 CP + 9 CP	Bachelor Thesis 12 CP
		180									

Figure 2: Structure of the Bachelor's degree program in Industrial Engineering and Management SPO 2015 as of winter semester 2021/2022 (recommended)

In the **basic program** (blue), the business administration, economics, informatics, operations research, engineering sciences, statistics and mathematics modules are compulsory. In the 3rd semester, one can choose between Material Transformation and Balances, Engineering Mechanics and Material Science in the engineering basic module.

In the **specialization program** (green), a module must be selected from each of the following areas: business administration, economics, informatics, operations research and engineering. As part of the mandatory courses, one seminar module (independent of the course) and two modules must be completed. One module can be selected from business administration or engineering subjects and the other from business administration, economics, informatics, operations research, engineering, statistics, law or sociology.

The **internship** can be completed before or during the Bachelor's program. The performance record of the completed internship is required for registration for the final module examination in the course.

One is free to structure his/her individual course plan as he/she wishes (taking into account the respective provisions of the study and examination regulations as well as applicable module regulations) and choose the semester he/she wishes to start and/or complete the selected modules. It is however strongly recommended to adhere to the proposal for the first three semesters. The content of the courses is interdisciplinary and coordinated accordingly; the intersection freedom of lectures and examination dates is guaranteed for the recommended study semester.

All modules of the basic and advanced program, including the various alternatives within the module, can be found in this module handbook. Seminars that can be taken up as part of the seminar module are published at the WiWi portal at <https://portal.wiwi.kit.edu/Seminare>.

### **3 New study plan as of winter semester 2021/2022**

For the winter semester 2021/2022, the basic program in the subjects business administration and mathematics has been changed. In the subject business administration, three modules, each worth 5 credit points, must be completed. In mathematics, the distribution of credit points for the three compulsory modules will change.

## 4 Qualification objectives of the Bachelor's degree in Industrial Engineering and Management

Graduates of the Bachelor's degree in Industrial Engineering and Management are equipped with strategically oriented knowledge in economics, engineering sciences, mathematics and information technology acquired during the three-semester core program.

The economics section includes business-related topics from the financial industry, company management, information industry, production management, marketing and accounting as well as economic correlations of microeconomics and macroeconomics.

The math section is divided into mathematics, statistics and operations research. It includes analysis and linear algebra, descriptive and inductive statistics, elementary probability theory and optimization methods.

In the engineering field, the focus is on material and energy balances, material characterization and development, engineering mechanics and electrical engineering.

The technological area is covered by the Applied and Theoretical Computer Science. Through the comprehensive methodological basis, the graduates are in a position to acknowledge and apply specialized basic concepts, methods, models and approaches. They are also able to analyze and review economic and technological structures and processes.

Graduates can independently solve basic engineering calculations and are able to apply important mathematical concepts and methods to solve concrete tasks.

The graduates have deeper knowledge in business administration, economics, computer science, operations research and engineering. Specialization is either done in the field of business administration or engineering depending on one's wishes. Additional knowledge in statistics, law or sociology is also offered depending on one's interests. They are able to react based on this knowledge from the different subjects and disciplines. They thereby largely operate independently in economic, technical and technological topics and survey, analyze, interpret and evaluate the situations systematically.

They are able to classify specialized problems as well as model and choose appropriate methods and procedures for solving the given tasks as well as derive improvement potentials. They know how to validate, illustrate and interpret the achieved results.

This practical use of their know-how also takes into account the social, scientific and ethical aspects.

Graduates of the Bachelor's degree in Industrial Engineering and Management master the basics of project management and are able to assume responsibility in interdisciplinary teams. They are in a position to argue and defend their position both before expert representatives and laypersons.

They have the ability to apply the acquired information on career-related activities in the industry, service sector or in the public management as well as take up a Master's degree program in Industrial Engineering and Management or any other related course.

## 5 Key Skills

The Bachelor's degree course in Industrial Engineering and Management at the Department of Economics and Management distinguishes itself by an exceptionally high level of interdisciplinarity. With the combination of business science, economics, informatics, operations research, mathematics as well as engineering and natural science, the integration of knowledge of different disciplines is an inherent element of the programme. As a result, interdisciplinary and connected thinking is encouraged in a natural way. The integrative taught key skills, which are acquired throughout the entire programme, can be classified into the following fields:

### Soft skills

- Team work, social communication and creativity techniques
- Presentations and presentation techniques
- Logical and systematical arguing and writing
- Structured problem solving and communication

### Enabling skills

- Decision making in business context
- Project management competences
- Fundamentals of business science
- English as a foreign language

### Orientalional knowledge

- Acquisition of interdisciplinary knowledge
- Institutional knowledge about economic and legal systems
- Knowledge about international organisations
- Media, technology and innovation

The integrative acquisition of key skills especially takes place in several compulsory courses during the bachelor programme, namely

- Basic programme in economics and business science
- Seminar module
- Mentoring of the bachelor thesis
- Internship
- Business science, economics and informatics modules

## 6 Field of study structure

Mandatory	
Preliminary Exam <i>This field will not influence the calculated grade of its parent.</i>	
Bachelor's Thesis	12 CR
Internship	10 CR
Business Administration	24 CR
Economics	19 CR
Informatics	24 CR
Operations Research	18 CR
Engineering Sciences	21 CR
Mathematics	21 CR
Statistics	10 CR
Compulsory Elective Modules	21 CR

### 6.1 Preliminary Exam

Mandatory	
M-WIWI-100950	Preliminary Exam
	0 CR

### 6.2 Bachelor's Thesis

**Credits**  
12

Mandatory	
M-WIWI-101601	Module Bachelor's Thesis
	12 CR

### 6.3 Internship

**Credits**  
10

Mandatory	
M-WIWI-101419	Internship
	10 CR

## 6.4 Business Administration

Credits  
24

Mandatory		
M-WIWI-105768	Management and Marketing	5 CR
M-WIWI-105769	Financing and Accounting	5 CR
M-WIWI-105770	Production, Logistics and Information Systems	5 CR
Specialisation Program Business Administration (Election: at least 9 credits)		
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101402	eFinance	9 CR
M-WIWI-101464	Energy Economics	9 CR
M-WIWI-101435	Essentials of Finance	9 CR
M-WIWI-103120	Financial Economics	9 CR
M-WIWI-102752	Fundamentals of Digital Service Systems	9 CR
M-WIWI-101424	Foundations of Marketing	9 CR
M-WIWI-105928	HR Management & Digital Workplace	9 CR
M-WIWI-101437	Industrial Production I	9 CR
M-WIWI-105981	Information Systems & Digital Business	9 CR
M-WIWI-106860	Leadership & Sustainable HR-Management <span style="color: red;">neu</span>	9 CR
M-WIWI-101425	Strategy and Organization	9 CR
M-WIWI-101465	Topics in Finance I	9 CR
M-WIWI-101423	Topics in Finance II	9 CR
M-WIWI-105482	Machine Learning and Data Science	9 CR

## 6.5 Economics

Credits  
19

Mandatory		
M-WIWI-101398	Introduction to Economics	10 CR
Specialisation Program Economics (Election: at least 9 credits)		
M-WIWI-106472	Advanced Macroeconomics	9 CR
M-WIWI-101499	Applied Microeconomics	9 CR
M-WIWI-101403	Public Finance	9 CR
M-WIWI-101599	Statistics and Econometrics	9 CR
M-WIWI-105414	Statistics and Econometrics II	9 CR
M-WIWI-101668	Economic Policy I	9 CR
M-WIWI-101501	Economic Theory	9 CR

## 6.6 Informatics

Credits  
24

Mandatory		
M-WIWI-101417	Foundations of Informatics	10 CR
M-WIWI-101581	Introduction to Programming	5 CR
Specialisation Program Informatics (Election: at least 9 credits)		
M-WIWI-105112	Applied Informatics	9 CR



## 6.7 Operations Research

**Credits**  
18

Mandatory		
M-WIWI-101418	Introduction to Operations Research	9 CR
Specialisation Program Operations Research (Election: 1 item)		
M-WIWI-101413	Applications of Operations Research	9 CR
M-WIWI-101414	Methodical Foundations of OR	9 CR
M-WIWI-103278	Optimization under Uncertainty	9 CR

## 6.8 Engineering Sciences

**Credits**  
21

Mandatory		
M-ETIT-101155	Electrical Engineering	3 CR
M-MACH-101259	Engineering Mechanics	3 CR
M-WIWI-101839	Additional Fundamentals of Engineering	3 CR
M-MACH-101260	Materials Science	3 CR
Specialisation Program Engineering Sciences (Election: at least 9 credits)		
M-WIWI-101404	Extracurricular Module in Engineering	9 CR
M-MACH-101274	Rail System Technology	9 CR
M-WIWI-104838	Introduction to Natural Hazards and Risk Analysis	9 CR
M-ETIT-106821	Electric Energy Systems and Power Generation <sup>neu</sup>	9 CR
M-MACH-101264	Handling Characteristics of Motor Vehicles	9 CR
M-MACH-101265	Vehicle Development	9 CR
M-MACH-101266	Automotive Engineering	9 CR
M-MACH-101276	Manufacturing Technology	9 CR
M-BGU-101004	Fundamentals of Construction	9 CR
M-MACH-101272	Integrated Production Planning	9 CR
M-MACH-105298	Logistics and Supply Chain Management	9 CR
M-MACH-106527	Mechanical Design A	9 CR
M-MACH-106236	Mechatronic Product Design	9 CR
M-ETIT-106581	Measurement, Control, and Manufacturing Measurement Technology	9 CR
M-MACH-101287	Microsystem Technology	9 CR
M-MACH-101267	Mobile Machines	9 CR
M-BGU-101067	Mobility and Infrastructure	9 CR
M-MACH-101270	Product Lifecycle Management	9 CR
M-MACH-106590	Production Engineering	9 CR
M-ETIT-106372	Signals and Systems	9 CR
M-MACH-101279	Technical Logistics	9 CR
M-MACH-101275	Combustion Engines I	9 CR
M-MACH-101303	Combustion Engines II	9 CR
M-MACH-101261	Emphasis in Fundamentals of Engineering	9 CR
M-MACH-101262	Emphasis Materials Science	9 CR
M-MACH-101286	Machine Tools and Industrial Handling	9 CR

**6.9 Mathematics****Credits**  
21

Mandatory		
M-MATH-105754	Mathematics 1	10 CR
M-MATH-105756	Mathematics 2	7 CR
M-MATH-105757	Mathematics 3	4 CR

**6.10 Statistics****Credits**  
10

Mandatory		
M-WIWI-101432	Introduction to Statistics	10 CR

## 6.11 Compulsory Elective Modules

Credits  
21

### Election notes

Within the scope of the elective compulsory area, the seminar module (independent of subject) and two modules are to be taken. One module must be chosen from the subjects Business Administration or Engineering Sciences, the other from the subjects Business Administration, Economics, Informatics, Operations Research, Engineering Sciences, Statistics, Law or Sociology.

<b>Mandatory</b>		
M-WIWI-101816	Seminar Module	3 CR
<b>Business Administration oder Engineering Sciences (Election: 9 credits)</b>		
M-WIWI-101404	Extracurricular Module in Engineering	9 CR
M-MACH-101274	Rail System Technology	9 CR
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101402	eFinance	9 CR
M-WIWI-104838	Introduction to Natural Hazards and Risk Analysis	9 CR
M-ETIT-106821	Electric Energy Systems and Power Generation <sup>neu</sup>	9 CR
M-WIWI-101464	Energy Economics	9 CR
M-WIWI-101435	Essentials of Finance	9 CR
M-MACH-101264	Handling Characteristics of Motor Vehicles	9 CR
M-MACH-101265	Vehicle Development	9 CR
M-MACH-101266	Automotive Engineering	9 CR
M-MACH-101276	Manufacturing Technology	9 CR
M-WIWI-103120	Financial Economics	9 CR
M-WIWI-102752	Fundamentals of Digital Service Systems	9 CR
M-BGU-101004	Fundamentals of Construction	9 CR
M-WIWI-101424	Foundations of Marketing	9 CR
M-WIWI-105928	HR Management & Digital Workplace	9 CR
M-WIWI-101437	Industrial Production I	9 CR
M-WIWI-105981	Information Systems & Digital Business	9 CR
M-MACH-101272	Integrated Production Planning	9 CR
M-WIWI-106860	Leadership & Sustainable HR-Management <sup>neu</sup>	9 CR
M-MACH-105298	Logistics and Supply Chain Management	9 CR
M-WIWI-105482	Machine Learning and Data Science	9 CR
M-MACH-106527	Mechanical Design A	9 CR
M-ETIT-106581	Measurement, Control, and Manufacturing Measurement Technology	9 CR
M-MACH-101287	Microsystem Technology	9 CR
M-MACH-101267	Mobile Machines	9 CR
M-BGU-101067	Mobility and Infrastructure	9 CR
M-MACH-101270	Product Lifecycle Management	9 CR
M-MACH-106590	Production Engineering	9 CR
M-ETIT-106372	Signals and Systems	9 CR
M-WIWI-101425	Strategy and Organization	9 CR
M-WIWI-101421	Supply Chain Management	9 CR
M-WIWI-105447	Team Project Management and Technology (BUS/ENG)	9 CR
M-MACH-101279	Technical Logistics	9 CR
M-WIWI-101465	Topics in Finance I	9 CR
M-WIWI-101423	Topics in Finance II	9 CR
M-MACH-101261	Emphasis in Fundamentals of Engineering	9 CR
M-MACH-101275	Combustion Engines I	9 CR
M-MACH-101303	Combustion Engines II	9 CR
M-MACH-101262	Emphasis Materials Science	9 CR
M-MACH-101286	Machine Tools and Industrial Handling	9 CR
<b>Business Administration (Election: at most 9 credits)</b>		
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101402	eFinance	9 CR

M-WIWI-101464	Energy Economics	9 CR
M-WIWI-101435	Essentials of Finance	9 CR
M-WIWI-103120	Financial Economics	9 CR
M-WIWI-102752	Fundamentals of Digital Service Systems	9 CR
M-WIWI-101424	Foundations of Marketing	9 CR
M-WIWI-105928	HR Management & Digital Workplace	9 CR
M-WIWI-101437	Industrial Production I	9 CR
M-WIWI-105981	Information Systems & Digital Business	9 CR
M-WIWI-106860	Leadership & Sustainable HR-Management <span style="color: red;">neu</span>	9 CR
M-WIWI-101425	Strategy and Organization	9 CR
M-WIWI-101421	Supply Chain Management	9 CR
M-WIWI-101465	Topics in Finance I	9 CR
M-WIWI-101423	Topics in Finance II	9 CR
M-WIWI-105482	Machine Learning and Data Science	9 CR
<b>Economics (Election: at most 9 credits)</b>		
M-WIWI-106472	Advanced Macroeconomics	9 CR
M-WIWI-101499	Applied Microeconomics	9 CR
M-WIWI-101403	Public Finance	9 CR
M-WIWI-101599	Statistics and Econometrics	9 CR
M-WIWI-105414	Statistics and Econometrics II	9 CR
M-WIWI-101668	Economic Policy I	9 CR
M-WIWI-101501	Economic Theory	9 CR
<b>Informatics (Election: at most 9 credits)</b>		
M-WIWI-101426	Electives in Informatics	9 CR
<b>Operations Research (Election: at most 9 credits)</b>		
M-WIWI-101413	Applications of Operations Research	9 CR
M-WIWI-101414	Methodical Foundations of OR	9 CR
M-WIWI-103278	Optimization under Uncertainty	9 CR
<b>Engineering Sciences (Election: at most 9 credits)</b>		
M-WIWI-101404	Extracurricular Module in Engineering	9 CR
M-MACH-101274	Rail System Technology	9 CR
M-WIWI-104838	Introduction to Natural Hazards and Risk Analysis	9 CR
M-ETIT-106821	Electric Energy Systems and Power Generation <span style="color: red;">neu</span>	9 CR
M-MACH-101264	Handling Characteristics of Motor Vehicles	9 CR
M-MACH-101265	Vehicle Development	9 CR
M-MACH-101266	Automotive Engineering	9 CR
M-MACH-101276	Manufacturing Technology	9 CR
M-BGU-101004	Fundamentals of Construction	9 CR
M-MACH-101272	Integrated Production Planning	9 CR
M-MACH-105298	Logistics and Supply Chain Management	9 CR
M-MACH-106527	Mechanical Design A	9 CR
M-ETIT-106581	Measurement, Control, and Manufacturing Measurement Technology	9 CR
M-MACH-101287	Microsystem Technology	9 CR
M-MACH-101267	Mobile Machines	9 CR
M-BGU-101067	Mobility and Infrastructure	9 CR
M-MACH-101270	Product Lifecycle Management	9 CR
M-MACH-106590	Production Engineering	9 CR
M-ETIT-106372	Signals and Systems	9 CR
M-MACH-101279	Technical Logistics	9 CR
M-MACH-101275	Combustion Engines I	9 CR

M-MACH-101303	Combustion Engines II	9 CR
M-MACH-101261	Emphasis in Fundamentals of Engineering	9 CR
M-MACH-101262	Emphasis Materials Science	9 CR
M-MACH-101286	Machine Tools and Industrial Handling	9 CR
M-MACH-106236	Mechatronic Product Design	9 CR
<b>Statistics (Election: at most 9 credits)</b>		
M-WIWI-101599	Statistics and Econometrics	9 CR
M-WIWI-105414	Statistics and Econometrics II	9 CR
<b>Law or Sociology (Election: at most 9 credits)</b>		
M-INFO-105084	Public and Civil Law	9 CR
M-GEISTSOZ-101167	Sociology/Empirical Social Research	9 CR
<b>Team Project (Election: at most 9 credits)</b>		
M-WIWI-105440	Team Project Management and Technology	9 CR

## 7 Modules

### M

## 7.1 Module: Additional Fundamentals of Engineering [M-WIWI-101839]

**Responsible:** Prof. Dr.-Ing. Alexander Fidlin  
 PD Dr. Volker Gaukel  
 Prof. Dr. Michael Hoffmann

**Organisation:** KIT Department of Economics and Management

**Part of:** [Engineering Sciences \(mandatory\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
3	Grade to a tenth	Each term	1 term	German	3	4

Compulsory Elective Courses (Election: between 3 and 5 credits)			
T-MACH-102079	<a href="#">Material Science II for Business Engineers</a>	5 CR	Wagner
T-MACH-102210	<a href="#">Introduction to Engineering Mechanics II : Dynamics</a>	5 CR	Fidlin
T-CIWVT-106058	<a href="#">Process Fundamentals by the Example of Food Production</a>	3 CR	Gaukel
T-ETIT-100534	<a href="#">Electrical Engineering for Business Engineers, Part II</a>	5 CR	Menesklou

### Competence Certificate

See course description.

### Prerequisites

None

### Competence Goal

See German version.

### Content

The module focuses on basic engineering topics related to materials science, engineering mechanics and food processing.

### Annotation

Please note that "Materials Science 2" and "Electrical Engineering II for Industrial Engineers" are not offered in the winter semester, but only in the summer semester.

### Workload

The total workload for this module is approximately 90 hours.

## M

## 7.2 Module: Advanced Macroeconomics [M-WIWI-106472]

**Responsible:** Prof. Dr. Johannes Brumm  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	English	3	2

Compulsory Elective Courses (Election: )			
T-WIWI-112723	<a href="#">Computational Macroeconomics</a>	4,5 CR	Brumm
T-WIWI-112735	<a href="#">Macroeconomics: Theory and Computation</a>	9 CR	Brumm
T-WIWI-109121	<a href="#">Macroeconomic Theory</a>	4,5 CR	Brumm

**Competence Certificate**

The module examination takes place either in the form of an overall examination of 9 LP on the course Macroeconomic Theory and the course Computational Macroeconomics, or via two individual examinations of 4.5 LP each. The duration of the overall examination is 120 minutes. The duration of an individual exam is 60 minutes. The examinations are offered every semester and can be repeated at any regular examination date.

**Competence Goal**

The student

- acquires knowledge of modern macroeconomic models
- is able to analyze and discuss fiscal and monetary policy issues
- understands algorithms for solving dynamic, stochastic models
- is able to apply learned numerical methods independently

**Content**

The module focuses on teaching both theoretical foundations and solution procedures for macroeconomic models.

**Annotation**

The two courses can be taken in any order. They complement each other, but do not build on each other.

**Workload**

The total workload for this module is approximately 270 hours. The exact distribution is made according to the credit points of the courses of the module.



## M

## 7.3 Module: Applications of Operations Research [M-WIWI-101413]

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Operations Research \(Specialisation Program Operations Research\)](#)  
[Compulsory Elective Modules \(Operations Research\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	9

Compulsory Elective Courses (Election: between 1 and 2 items)			
T-WIWI-102704	<a href="#">Facility Location and Strategic Supply Chain Management</a>	4,5 CR	Nickel
T-WIWI-102714	<a href="#">Tactical and Operational Supply Chain Management</a>	4,5 CR	Nickel
Supplementary Courses (Election: at most 1 item)			
T-WIWI-102726	<a href="#">Global Optimization I</a>	4,5 CR	Stein
T-WIWI-106199	<a href="#">Modeling and OR-Software: Introduction</a>	4,5 CR	Nickel
T-WIWI-106545	<a href="#">Optimization under Uncertainty</a>	4,5 CR	Rebennack

### Competence Certificate

The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

At least one of the courses *Facility Location and strategic Supply Chain Management* and *Tactical and operational Supply Chain Management* has to be taken.

### Competence Goal

The student

- is familiar with basic concepts and terms of Supply Chain Management,
- knows the different areas of Supply Chain Management and their respective optimization problems,
- is acquainted with classical location problem models (in the plane, on networks and discrete) as well as fundamental methods for distribution and transport planning, inventory planning and management,
- is able to model practical problems mathematically and estimate their complexity as well as choose and adapt appropriate solution methods.

### Content

Supply Chain Management is concerned with the planning and optimization of the entire, inter-company procurement, production and distribution process for several products taking place between different business partners (suppliers, logistics service providers, dealers). The main goal is to minimize the overall costs while taking into account several constraints including the satisfaction of customer demands.

This module considers several areas of Supply Chain Management. On the one hand, the determination of optimal locations within a supply chain is addressed. Strategic decisions concerning the location of facilities like production plants, distribution centers or warehouses are of high importance for the rentability of supply chains. Thoroughly carried out, location planning tasks allow an efficient flow of materials and lead to lower costs and increased customer service. On the other hand, the planning of material transport in the context of Supply Chain Management represents another focus of this module. By linking transport connections and different facilities, the material source (production plant) is connected with the material sink (customer). For given material flows or shipments, it is considered how to choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints.

Furthermore, this module offers the possibility to learn about different aspects of the tactical and operational planning level in Supply Chain Management, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.

### Annotation

The planned lectures and courses for the next three years are announced online.

**Workload**

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

**Recommendation**

The courses Introduction to Operations Research I and II are helpful.

## M

## 7.4 Module: Applied Informatics [M-WIWI-105112]

**Responsible:** Dr.-Ing. Tobias Käfer  
Prof. Dr. Andreas Oberweis  
Prof. Dr. Ali Sunyaev  
Prof. Dr. Melanie Volkamer

**Organisation:** KIT Department of Economics and Management

**Part of:** Informatics (Specialisation Program Informatics)

Credits	Grading scale	Recurrence	Duration	Level	Version
9	Grade to a tenth	Each term	1 term	3	1

Advanced Programming (Election: 1 item)			
T-WIWI-102747	Advanced Programming - Java Network Programming	4,5 CR	Ratz, Zöllner
T-WIWI-102748	Advanced Programming - Application of Business Software	4,5 CR	Klink, Oberweis
Compulsory Elective Area (Election: 1 item)			
T-WIWI-110340	Applied Informatics – Applications of Artificial Intelligence	4,5 CR	Käfer
T-WIWI-110341	Applied Informatics – Database Systems	4,5 CR	Oberweis
T-WIWI-110342	Applied Informatics – Information Security	4,5 CR	Volkamer
T-WIWI-110339	Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	4,5 CR	Sunyaev
T-WIWI-110338	Applied Informatics – Modelling	4,5 CR	Oberweis
T-WIWI-110343	Applied Informatics – Software Engineering	4,5 CR	Oberweis

### Competence Certificate

The assessment is carried out as two partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

- Partial exam I: *Advanced Programming - Java Network Programming* or alternatively *Advanced Programming - Application of Business Software*
- Partial exam II: all the rest

The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Competence Goal

The student

- has the capability of dealing with the practical application of the Java programming language (which is the dominating programming language in many application areas) or alternatively the ability to configure, parameterize and deploy enterprise software to enable, support and automate business processes,
- knows in depth methods and systems of a core area or a core application area of Informatics according to the contents dealt with in the lectures,
- can choose these methods and system situation adequately and can furthermore design and employ them for problem solving,
- is able to independently find strategic and creative answers in the finding of solutions to well defined, concrete, and abstract problems.

### Content

In this module, object-oriented programming skills using the Java programming language are further deepened. Alternatively important fundamentals of business information systems are conveyed that enable, support and accelerate new forms of business processes and organizational forms. Based on a core application area, basic methods and techniques of computer science are presented.

### Workload

The total workload for this module is approximately 270 hours. For further information see German version.

## M

## 7.5 Module: Applied Microeconomics [M-WIWI-101499]

**Responsible:** Prof. Dr. Johannes Philipp Reiß  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	3

Compulsory Elective Courses (Election: at least 9 credits)			
T-WIWI-102876	<a href="#">Auction &amp; Mechanism Design</a>	4,5 CR	Szech
T-WIWI-112228	<a href="#">Digital Markets and Market Design</a>	4,5 CR	Hillenbrand
T-WIWI-102892	<a href="#">Economics and Behavior</a>	4,5 CR	Szech
T-WIWI-102850	<a href="#">Introduction to Game Theory</a>	4,5 CR	Puppe, Reiß
T-WIWI-102792	<a href="#">Decision Theory</a>	4,5 CR	Ehrhart
T-WIWI-102844	<a href="#">Industrial Organization</a>	4,5 CR	Reiß
T-WIWI-102739	<a href="#">Public Revenues</a>	4,5 CR	Wigger
T-WIWI-102736	<a href="#">Economics III: Introduction in Econometrics</a>	5 CR	Schienle
T-WIWI-100005	<a href="#">Competition in Networks</a>	4,5 CR	Mitusch

**Competence Certificate**

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Prerequisites**

None.

**Competence Goal**

Students

- are introduced to the basic theoretical analysis of strategic interaction situations and shall be able to analyze situations of strategic interaction systematically and to use game theory to predict outcomes and give advice in applied economics settings, (course "Introduction to Game Theory");
- are exposed to the basic problems of imperfect competition and its implications for policy making; (course "Industrial Organization");
- are provided with the basic economics of network industries (e.g., telecom, utilities, IT, and transport sectors) and should get a vivid idea of the special characteristics of network industries concerning planning, competition, competitive distortion, and state intervention, (course "Competition in Networks").

**Content**

The module's purpose is to extend and foster skills in microeconomic theory by investigating a variety of applications. Students shall be able to analyze real-life problems using microeconomics.

**Workload**

Total workload for 9 credit points: approx. 270 hours.

The exact distribution is based on the credit points of the courses in the module.

**Recommendation**

Completion of the module Economics is strongly recommended.

## M

## 7.6 Module: Automotive Engineering [M-MACH-101266]

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	4	6

Automotive Engineering (Election: at least 9 credits)			
T-MACH-102203	<a href="#">Automotive Engineering I</a>	6 CR	Gauterin, Gießler
T-MACH-112126	<a href="#">Data-Driven Algorithms in Vehicle Technology</a>	4 CR	Scheubner
T-MACH-102093	<a href="#">Fluid Power Systems</a>	5 CR	Geimer
T-MACH-100092	<a href="#">Automotive Engineering I</a>	6 CR	Gauterin, Gießler
T-MACH-102117	<a href="#">Automotive Engineering II</a>	3 CR	Gauterin, Gießler
T-MACH-102116	<a href="#">Fundamentals for Design of Motor-Vehicle Bodies I</a>	1,5 CR	Bardehle
T-MACH-102119	<a href="#">Fundamentals for Design of Motor-Vehicle Bodies II</a>	1,5 CR	Bardehle
T-MACH-110796	<a href="#">Python Algorithm for Vehicle Technology</a>	4 CR	Rhode
T-MACH-102156	<a href="#">Project Workshop: Automotive Engineering</a>	4,5 CR	Frey, Gauterin, Gießler
T-MACH-111820	<a href="#">Control of Mobile Machines – Prerequisites</a>	0 CR	Becker, Geimer
T-MACH-111821	<a href="#">Control of Mobile Machines</a>	4 CR	Becker, Geimer

**Competence Certificate**

The assessment is carried out as partial exams.

The partial exams consists of a written exam (90 to 120 minutes) or an oral exam (duration 30 to 40 minutes).

**Prerequisites**

None

**Competence Goal**

The student

- knows the most important components of a vehicle,
- knows and understands the functioning and the interaction of the individual components,
- knows the basics of dimensioning the components.

**Content**

In the module Automotive Engineering the basics are taught, which are important for the development, the design, the production and the operation of vehicles. Particularly the primary important aggregates like engine, gear, drive train, chasis and auxiliary equipment are explained, but also all technical equipment, which make the operation safer and easier. Additionally the interior equipment is examined, which shall provide a preferably comfortable, optimum ambience to the user.

In the module Automotive Engineering the focus is on passenger cars and commercial vehicles, which are designed for road applications.

**Workload**

The total work load for this module is about 270 Hours (9 Credits). The partition of the work load is carried out according to the credit points of the courses of the module. The work load for courses with 6 credit points is about 180 hours, for courses with 4.5 credit points about 135 hours, for courses with 3 credit points about 90 hours, and for courses with 1.5 credit points about 45 hours. The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam duration and the time that is required to achieve the objectives of the module as an average student with an average performance.

**Recommendation**

Knowledge of the content of the courses *Engineering Mechanics I* [2161238] and *Engineering Mechanics II* [1262276] is helpful.

**Learning type**

The teaching and learning procedures (lecture, lab course, workshop) are described for each course of the module separately.

## M

## 7.7 Module: Combustion Engines I [M-MACH-101275]

**Responsible:** Prof. Dr. Thomas Koch  
Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Level	Version
9	Grade to a tenth	Each winter term	1 term	4	5

Wahlpflicht (Election: between 1 and 2 items)			
T-MACH-111550	CO <sub>2</sub> -Neutral Combustion Engines and their Fuels I	5 CR	Koch
T-MACH-111585	Hydrogen and reFuels - Energy Conversion in Combustion Engines	4 CR	Kubach

### Competence Certificate

The module examination contains of two oral examinations. The module score results from the two scores weighted according to the ECTS.

### Prerequisites

None

### Competence Goal

The student can name and explain the working princile of combustion engines. He is able to analyse and evaluate the combustion process. He is able to evaluate influences of gas exchange, mixture formation, fuels and exhaust gas aftertreatment on the combustion performance. He can solve basic research problems in the field of engine development.

The student can name all important influences on the combustion process. He can analyse and evaluate the engine process considering efficiency, emissions and potential.

### Content

Working Principle og ICE

Characteristic Parameters

Characteristic parameters

Engine parts

Crank drive

Fuels

Gasolien engine operation modes

Diesel engine operation modes

Emissions

Fundamentals of ICE combustion

Thermodynamics of ICE

Flow field

Wall heat losses

Combsution in Gasoline and Diesel engines

Heat release calculation

Waste heat recovery

CO<sub>2</sub>-free engine technology

### Workload

regular attendance: 62 hours

self-study: 208 hours

## M

## 7.8 Module: Combustion Engines II [M-MACH-101303]

**Responsible:** Dr.-Ing. Heiko Kubach  
Julia Reichel

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	4	4

Mandatory			
T-MACH-111560	CO <sub>2</sub> -Neutral Combustion Engines and their Fuels II	5 CR	Koch
Verbrennungsmotoren II (Election: at least 4 credits)			
T-MACH-105173	Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines	4 CR	Gohl
T-MACH-105649	Boosting of Combustion Engines	4 CR	Kech, Kubach
T-MACH-105184	Fuels and Lubricants for Combustion Engines	4 CR	Kehrwald, Kubach
T-MACH-110817	Development of Hybrid Drivetrains	4 CR	Koch
T-MACH-110816	Large Diesel and Gas Engines for Ship Propulsions	4 CR	Kubach
T-MACH-105044	Fundamentals of Catalytic Exhaust Gas Aftertreatment	4 CR	Deutschmann, Grunwaldt, Kubach, Lox
T-MACH-105167	Analysis Tools for Combustion Diagnostics	4 CR	Pfeil
T-MACH-105169	Engine Measurement Techniques	4 CR	Bernhardt
T-MACH-111578	Sustainable Vehicle Drivetrains	4 CR	Koch, Toedter
T-MACH-105985	Ignition Systems	4 CR	Toedter

### Competence Certificate

The assessment consists of an oral exam (60 min) taking place in the recess period (according to §4 (2), 2 of the examination regulation). The exam takes place in every semester. Reexaminations are offered at every ordinary examination date.

### Prerequisites

It is only possible to choose this module in combination with the module *Combustion Engines I*. The module is passed only after the final partial exam of *Combustion Engines I* is additionally passed.

The course *Combustion Engines II* [2134131] has to be attended.

### Competence Goal

See courses.

### Content

#### Compulsory:

Supercharging and air management

Engine maps Emissions and Exhaust gas aftertreatment

Transient engine operation ECU application

Electrification and alternative powertrains

#### Elective:

Fuels and lubricants for ICE

Fundamentals of catalytic EGA

Analysis tools for combustion diagnostics

Engine measurement techniques

Analysis of Exhaust Gas und Lubricating Oil in Combustion Engines



**Workload**

regular attendance: 62 h

self-study: 208 h

**Learning type**

Lecture, Tutorial

## M

## 7.9 Module: eBusiness and Service Management [M-WIWI-101434]

**Responsible:** Prof. Dr. Christof Weinhardt

**Organisation:** KIT Department of Economics and Management

**Part of:** Business Administration (Specialisation Program Business Administration)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	11

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-113160	Digital Democracy	4,5 CR	Fegert
T-WIWI-111307	Digital Services: Foundations	4,5 CR	Satzger, Vössing
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-109816	Foundations of Interactive Systems	4,5 CR	Mädche
T-WIWI-107506	Platform Economy	4,5 CR	Weinhardt
T-WIWI-109940	Special Topics in Information Systems	4,5 CR	Weinhardt

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

None

### Competence Goal

The students

- understand the strategic and operative design of information and information products,
- analyze the role of information on markets,
- evaluate case studies regarding information products,
- develop solutions in teams.

### Content

This module gives an overview of the mutual dependencies of strategic management and information systems. The central role of information is exemplified by the structuring concept of the information life cycle.

The single phases of this life cycle from generation over allocation until dissemination and use of the information are analyzed from a business and microeconomic perspective, applying classical and new theories. The state of the art of economic theory on aspects of the information life cycle are presented. The lecture is complemented by exercise courses. The courses "Platform Economy", "eFinance: Information systems in finance" and "eServices" constitute three different application domains in which the basic principles of the Internet Economy are deepened. In the core lecture "Platform Economy" the focus is set on markets between two parties that act through an intermediary on an Internet platform. Topics discussed are network effects, peer-to-peer markets, blockchains and marketdesign. The course is held in English and teaches parts of the syllabus with the support of a case study in which students analyze a platform.

The course "eFinance: information systems for securities trading" provides theoretically profound and also practical-oriented background about the functioning of international financial markets. The focus is placed on the economic and technical design of markets as information processing systems.

In "eServices" the increasing impact of electronic services compared to the traditional services is outlined. The Information- und Communication Technologies enable the provision of services, which are mainly characterized by interactivity and individuality. This course provides basic knowledge about the development and management of ICT-based services.

The theoretic fundamentals of Information systems can be enriched by a practical experience in Special Topics in Information Engineering and Management. Any practical Seminar at the IM can be chosen for the course Special Topics in Information systems.

**Annotation**

All practical Seminars offered at the IM can be chosen for *Special Topics in Information Systems*. Please update yourself on [www.iism.kit.edu/im/lehre](http://www.iism.kit.edu/im/lehre)

**Workload**

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

## M

## 7.10 Module: Economic Policy I [M-WIWI-101668]

**Responsible:** Prof. Dr. Ingrid Ott  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	9

Mandatory			
T-WIWI-103213	<a href="#">Basic Principles of Economic Policy</a>	4,5 CR	Ott
Compulsory Elective Courses (Election: 1 item)			
T-WIWI-109121	<a href="#">Macroeconomic Theory</a>	4,5 CR	Brumm
T-WIWI-102739	<a href="#">Public Revenues</a>	4,5 CR	Wigger
T-WIWI-102908	<a href="#">Personnel Policies and Labor Market Institutions</a>	4,5 CR	Nieken
T-WIWI-100005	<a href="#">Competition in Networks</a>	4,5 CR	Mitusch

**Competence Certificate**

The module examination takes place in the form of examinations (§4(2),1 SPO) of the selected partial module performance. The examination is carried out separately for each partial module and is described there. It is possible to repeat examinations at any regular examination date.

The grades of the partial module correspond to the grades of the passed examinations. The overall grade of the module is formed from the grades of the partial performances weighted with LP.

**Prerequisites**

The course "Introduction to Economic Policy" is mandatory in the module.

**Competence Goal**

Students shall be given the ability to

- understand and deepen basic concepts of micro- and macroeconomic theories
- apply those theories to economic policy issues
- understand government interventions in the market and their legitimation from the perspective of economic welfare
- learn how theory-based policy recommendations are derived

**Content**

- Intervention in the market: micro-economic perspective
- Intervention in the market: macroeconomic perspective
- Institutional economic aspects
- Economic policy and welfare economics
- Carriers of economic policy: political-economic aspects

**Workload**

Total effort for 9 credit points: approx. 270 hours. The distribution is made according to the credit points of the courses of the module.

**Recommendation**

Basic knowledge of micro- and macroeconomics is strongly recommended, as taught in the courses Economics I [2610012], and Economics II [2600014].

## M

## 7.11 Module: Economic Theory [M-WIWI-101501]

**Responsible:** Prof. Dr. Clemens Puppe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)

<b>Credits</b> 9	<b>Grading scale</b> Grade to a tenth	<b>Recurrence</b> Each term	<b>Duration</b> 2 terms	<b>Language</b> German/English	<b>Level</b> 3	<b>Version</b> 3
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Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102609	<a href="#">Advanced Topics in Economic Theory</a>	4,5 CR	Mitusch
T-WIWI-102876	<a href="#">Auction &amp; Mechanism Design</a>	4,5 CR	Szech
T-WIWI-102892	<a href="#">Economics and Behavior</a>	4,5 CR	Szech
T-WIWI-102850	<a href="#">Introduction to Game Theory</a>	4,5 CR	Puppe, Reiß
T-WIWI-102844	<a href="#">Industrial Organization</a>	4,5 CR	Reiß
T-WIWI-109121	<a href="#">Macroeconomic Theory</a>	4,5 CR	Brumm
T-WIWI-102610	<a href="#">Welfare Economics</a>	4,5 CR	Puppe

**Competence Certificate**

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Prerequisites**

None

**Competence Goal**

Students

- master concepts that are central to (micro-)economic theory and are familiar with their real-world applications,
- will be able to interpret and critically assess microeconomic models,
- attain in-depth knowledge of the theory of strategic decision making and of general equilibrium models,
- can apply methods from welfare economics to analyze issues like distributional fairness and equality of opportunity.

**Content**

The module covers central concepts in microeconomic theory as well as their applications. This includes an in-depth introduction to the modelling language and the equilibrium concepts (Nash equilibrium, sub-game-perfect Nash equilibrium, etc.) of non-cooperative game theory ("Introduction to Game Theory") as well as its applications to problems of imperfect competition and industrial organization ("Industrieökonomie") and the design of auctions and (incentive-)mechanisms ("Auction & Mechanism Design").

A further focus of the module is on the development of a micro-founded general equilibrium model in order to examine key macroeconomic issues such as public debt and labor market as well as monetary policies ("Macroeconomic Theory"). Students may also delve deeper into the basics of behavioral economics and experimental design ("Economics & Behavior") as well as into questions of equality of opportunity and the fairness and efficiency of economic allocations ("Wohlfahrtstheorie").

**Annotation**

Please note that the course T-WIWI-102609 "Advanced Topics in Economic Theory" is currently not available.

**Workload**

The total workload for this module is approximately 270 hours (9 credit points). The distribution is done according to the credit points of the courses of the module. The workload for courses with 4.5 credit points is approx. 135 hours. The total number of hours per course is calculated from the time required for attending lectures and exercises, as well as examination times and the time required for an average student to achieve the learning objectives of the module.

**Recommendation**

None

## M

## 7.12 Module: eFinance [M-WIWI-101402]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Business Administration (Specialisation Program Business Administration)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	3	9

Mandatory			
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
Supplementary Courses (Election: at least 4,5 credits)			
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-112694	FinTech	4,5 CR	Thimme
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

The course *eFinance: Information Systems for Securities Trading* [2540454] is compulsory and must be examined.

### Competence Goal

The students

- are able to understand and analyse the value creation chain in stock broking,
- are able to adequately identify, design and use methods and systems to solve problems in finance,
- are able to evaluate and criticize investment decisions by traders,
- are able to apply theoretical methods of econometrics,
- learn to elaborate solutions in a team.

### Content

The module "eFinance" addresses current problems in the finance sector. It is investigated the role of information and knowledge in the finance sector and how information systems can solve or extenuate them. Speakers from practice will contribute to lectures with their broad knowledge. Core courses of the module deal with the background of banks and insurance companies and the electronic commerce of stocks in global finance markets. In addition the course Derivatives offers an insight into future and forward contracts as well as the assesment of options. Exchanges and International Finance are also alternatives which provide a supplementary understanding for capital markets.

Information management topics are the focus of the lecture "eFinance: Information Systems for Securities Trading". For the functioning of the international finance markets, it is necessary that there is an efficient information flow. Also, the regulatory frameworks play an important role. In this context, the role and the functioning of (electronic) stock markets, online brokers and other finance intermediaries and their platforms are presented. Not only IT concepts of German finance intermediaries are presented, but also international system approaches will be compared. The lecture is supplemented by speakers from the practice (and excursions, if possible) coming from the Deutsche Börse and the Stuttgart Stock Exchange.

### Annotation

The current seminar courses for this semester, which are complementary to this module, are listed on following webpage: the <http://www.iism.kit.edu/im/lehre>

### Workload

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

## M

## 7.13 Module: Electives in Informatics [M-WIWI-101426]

**Responsible:** Dr.-Ing. Tobias Käfer  
 Prof. Dr. Andreas Oberweis  
 Prof. Dr. Ali Sunyaev  
 Prof. Dr. Melanie Volkamer

**Organisation:** KIT Department of Economics and Management

**Part of:** [Compulsory Elective Modules \(Informatics\)](#)

Credits	Grading scale	Recurrence	Duration	Level	Version
9	Grade to a tenth	Each term	1 term	3	14

Compulsory Elective Area (Election: between 1 and 2 items)			
T-WIWI-110340	<a href="#">Applied Informatics – Applications of Artificial Intelligence</a>	4,5 CR	Käfer
T-WIWI-110341	<a href="#">Applied Informatics – Database Systems</a>	4,5 CR	Oberweis
T-WIWI-110342	<a href="#">Applied Informatics – Information Security</a>	4,5 CR	Volkamer
T-WIWI-110339	<a href="#">Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services</a>	4,5 CR	Sunyaev
T-WIWI-110338	<a href="#">Applied Informatics – Modelling</a>	4,5 CR	Oberweis
T-WIWI-110343	<a href="#">Applied Informatics – Software Engineering</a>	4,5 CR	Oberweis
T-WIWI-110711	<a href="#">Supplement Applied Informatics</a>	4,5 CR	Professorenschaft des Instituts AIFB
T-WIWI-104679	<a href="#">Foundations of Mobile Business</a>	4,5 CR	Oberweis
Advanced Labs (Election: at most 1 item)			
T-WIWI-111127	<a href="#">Advanced Lab Blockchain Hackathon (Bachelor)</a>	4,5 CR	Sunyaev
T-WIWI-111124	<a href="#">Advanced Lab Sociotechnical Information Systems Development (Bachelor)</a>	4,5 CR	Sunyaev
T-WIWI-110541	<a href="#">Advanced Lab Informatics (Bachelor)</a>	4,5 CR	Professorenschaft des Instituts AIFB
T-WIWI-112915	<a href="#">Advanced Lab Realization of Innovative Services (Bachelor)</a>	4,5 CR	Oberweis
T-WIWI-108439	<a href="#">Advanced Lab Security, Usability and Society</a>	4,5 CR	Volkamer

**Competence Certificate**

The assessment is carried out as two partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Prerequisites**

None

**Competence Goal**

The student

- knows and has mastered methods and systems for core topics and core application areas of computer science,
- can choose these methods and system situation adequately and can furthermore design and employ them for problem solving,
- is able to independently find strategic and creative answers in the finding of solutions to well defined, concrete, and abstract problems.

**Content**

The elective module conveys advanced knowledge in the area of applied computer science. This includes, for example, the efficient design and optimization of technical systems, the design and management of database applications or the systematic development of large software systems. Moreover, modeling of complex systems, the use of computer science methods to support knowledge management, and the design and implementation of service-oriented architectures are discussed in this module.

**Workload**

Total workload for 9 credit points: approx. 270 hours

The exact distribution is based on the credit points of the courses in the module.



## M

## 7.14 Module: Electric Energy Systems and Power Generation [M-ETIT-106821]

<b>Responsible:</b>	Prof. Dr.-Ing. Marc Hiller Dr.-Ing. Bernd Hoferer Prof. Dr.-Ing. Thomas Leibfried
<b>Organisation:</b>	KIT Department of Electrical Engineering and Information Technology
<b>Part of:</b>	Engineering Sciences (Specialisation Program Engineering Sciences) Compulsory Elective Modules (Business Administration oder Engineering Sciences) Compulsory Elective Modules (Engineering Sciences)

<b>Credits</b>	<b>Grading scale</b>	<b>Recurrence</b>	<b>Duration</b>	<b>Language</b>	<b>Level</b>	<b>Version</b>
9	Grade to a tenth	Each term	2 terms	German	3	1

Mandatory			
T-ETIT-101924	Power Generation	3 CR	Hoferer
T-ETIT-112850	Electric Energy Systems	6 CR	Hiller, Leibfried

**Competence Certificate****Electric Energy Systems:**

Success control takes place in the form of a written examination lasting 120 minutes.

**Power Generation:**

Success control takes place in the form of an overall oral examination (approx. 20 minutes) on the selected course.

**Prerequisites**

none

**Competence Goal****Electric Energy Systems:**

Students learn about the main types of electrical machines. They can explain how they work and are able to calculate the operating behavior of electrical machines on the basis of simple models and using the electrical engineering basics they have already learned in the field of alternating current theory.

In addition, students learn about the most important self-controlled power converter circuits for energy and drive applications. This also includes the basic properties of the most important power semiconductors, whereby students are able to describe their behavior using characteristic curves and simple models.

Students will be able to analyze network feedback and the effect of power converters on the electrical machine. They can also recognize the components in energy transmission and drive systems and describe their function. Furthermore, they can calculate the behavior of the system components by coupling the models of the power converter, grid and machine.

Students will also be able to assess the role that power electronics will play in a sustainable energy supply and which technologies are crucial for a sustainable conversion and expansion of the electrical energy supply.

Students learn about the structure of the electrical energy supply network in Europe and especially in Germany. They know the laws of high-voltage direct current and high-voltage three-phase current transmission and can name the respective advantages and disadvantages and know the respective characteristics of active and reactive power transmission and the resulting technical consequences. Students will be familiar with the grid operating equipment, its structure and its mode of operation in the grid and will be able to carry out calculations with regard to the parameters important for grid operation. They will be able to name and calculate important design guidelines and operating characteristics of grid equipment. Using transformers as an example, they can carry out a basic design.

**Power Generation:**

Students are able to recognize energy technology problems and develop solutions. They have gained an understanding of the physical and theoretical relationships in energy technology. They are also able to describe, analyze and explain the developed solutions in a scientific format.

**Content****Electric Energy Systems:****Part Hiller:**

In this basic lecture, the section on drive technology and power electronics begins by explaining the mode of operation and operating behavior of the most important electrical machines. The focus is on rotary field machines (asynchronous machines, electrically and permanently excited synchronous machines, synchronous reluctance machines).

The most important power semiconductor components and their basic function are then presented. Building on this, the essential power converter circuits for applications in energy and drive technology (including electromobility) are presented. Their function and operating behavior are described.

In addition, the mode of operation and areas of application of electrical machines and power electronic circuits for grid and drive applications are explained in more detail using practical examples.

**Part Leibfried:**

The lecture begins with an introduction to the structure of the electrical power supply system and the basics of power calculation in the three-phase system. Furthermore, the basic laws for the transmission of electrical energy with direct and alternating current (high-voltage direct current transmission, HGÜ) and high-voltage three-phase current transmission, HDÜ) are dealt with. Another large chapter deals with electrical grid equipment such as generators, transformers, current and voltage transformers, capacitive and inductive compensators as well as overhead lines and cables.

**Power Generation:**

Basic lecture on the generation of electrical energy. From the conversion of the earth's primary energy resources in coal-fired power plants and in nuclear power plants to the use of renewable energies, the lecture covers the entire spectrum of generation. The lecture provides an overview of the physical principles, the technical and economic aspects and the development potential of generating electrical energy from both conventional and renewable sources.

**Module grade calculation**

The module grade is calculated from the average value of the written and oral examinations weighted according to CP.

**Workload****Electric Energy Systems:**

- Attendance time in VL and Ü (4 SWS a 15 h):  $4 * 15 \text{ h} = 60 \text{ h}$
- Preparation/follow-up of the lecture:  $14 * 2 \text{ h} = 28 \text{ h}$
- Preparation/follow-up of the exercise:  $14 * 2 \text{ h} = 28 \text{ h}$
- Exam preparation: = 60 h
- Examination time: = 2 h
- **Total: 178 h = 6 LP**

**Power Generation:**

- Attendance time: 30 h
- Self-study time: 60 h
- **Total 90 h = 3 LP**

## M

## 7.15 Module: Electrical Engineering [M-ETIT-101155]

**Responsible:** Dr. Wolfgang Menesklou  
**Organisation:** KIT Department of Electrical Engineering and Information Technology  
**Part of:** [Engineering Sciences \(mandatory\)](#)

Credits	Grading scale	Recurrence	Duration	Level	Version
3	Grade to a tenth	Each winter term	1 term	3	1

Mandatory			
T-ETIT-100533	<a href="#">Electrical Engineering for Business Engineers, Part I</a>	3 CR	Menesklou

**Competence Certificate**

The assessment takes place in the form of a written examination lasting 2 hours.

**Competence Goal**

The student knows and understands basic terms of electrical engineering and should be able to carry out simple calculations of DC and AC circuits.

**Content**

Supporting the lecture, assignments to the curriculum are distributed. These are solved into additional (voluntary) tutorials.

**Module grade calculation**

The module grade is the grade of the written exam.

**Workload**

See German version.

## M

## 7.16 Module: Emphasis in Fundamentals of Engineering [M-MACH-101261]

**Responsible:** Prof. Dr.-Ing. Alexander Fidlin  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Level	Version
9	Grade to a tenth	Each term	1 term	4	2

Specialization in Fundamentals of Engineering (Election: at least 9 credits)			
T-ETIT-100534	<a href="#">Electrical Engineering for Business Engineers, Part II</a>	5 CR	Menesklou
T-MACH-102079	<a href="#">Material Science II for Business Engineers</a>	5 CR	Wagner
T-MACH-102210	<a href="#">Introduction to Engineering Mechanics II : Dynamics</a>	5 CR	Fidlin

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is removed from the average of the partial examinations, with at least two partial exams need to be.

### Competence Goal

Students acquire and deepen skills in engineering fundamentals and can apply them to technical problems. Specific teaching objectives are agreed with the respective coordinator of the course.

### Content

The module content depends on the elected courses.

### Annotation

Starting winter term 2016/1017 the course "Introduction to Engineering Mechanics II : Dynamics" [2162276] will be held in winter term.

### Workload

See German version.

## M

## 7.17 Module: Emphasis Materials Science [M-MACH-101262]

**Responsible:** Dr.-Ing. Wilfried Liebig

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	4	4

Specialization Materials Science (Election: at least 9 credits)			
T-MACH-102141	Constitution and Properties of Wearresistant Materials	4 CR	Ulrich
T-MACH-105179	Functional Ceramics	4 CR	Hinterstein, Rheinheimer
T-MACH-100287	Introduction to Ceramics	6 CR	Schell
T-MACH-102102	Physical Basics of Laser Technology	5 CR	Schneider
T-MACH-102137	Polymer Engineering I	4 CR	Liebig
T-MACH-102138	Polymer Engineering II	4 CR	Liebig
T-MACH-102157	High Performance Powder Metallurgy Materials	4 CR	Schell
T-MACH-112106	Fatigue of Materials	4 CR	Guth
T-MACH-102170	Structural and Phase Analysis	4 CR	Wagner
T-MACH-100531	Systematic Materials Selection	4 CR	Dietrich, Schulze
T-MACH-102139	Failure of Structural Materials: Fatigue and Creep	4 CR	Gruber, Gumbsch
T-MACH-102140	Failure of Structural Materials: Deformation and Fracture	4 CR	Gumbsch, Weygand
T-MACH-102079	Material Science II for Business Engineers	5 CR	Wagner

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

### Prerequisites

None

### Competence Goal

Students acquire and deepen skills in fundamentals of materials science and engineering and can apply them to technical problems. Specific teaching objectives are agreed with the respective coordinator of the course.

### Content

The module content depends on the elected courses.

### Module grade calculation

The overall grade of the module is removed from the average of the partial examinations, with at least two partial exams need to be.

### Workload

The module requires an average workload of 270 hours.

### Learning type

Lecture, Tutorial.

## M

## 7.18 Module: Energy Economics [M-WIWI-101464]

**Responsible:** Prof. Dr. Wolf Fichtner

**Organisation:** KIT Department of Economics and Management

**Part of:** Business Administration (Specialisation Program Business Administration)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	4

Mandatory			
T-WIWI-102746	Introduction to Energy Economics	5,5 CR	Fichtner
Supplementary Courses (Election: 3,5 credits)			
T-WIWI-102607	Energy Policy	3,5 CR	Wietschel
T-WIWI-100806	Renewable Energy-Resources, Technologies and Economics	3,5 CR	Jochem

### Competence Certificate

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) about the lecture *Introduction into Energy Economics* [2581010] and one optional lecture of the module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

The lecture *Introduction into Energy Economics* [2581010] has to be examined.

### Competence Goal

The student

- is able to understand interdependencies in energy economics and to evaluate ecological impacts in energy supply,
- is able to assess the different energy carriers and their characteristics,
- knows the energy political framework conditions,
- gains knowledge about new market-based conditions and the cost and potentials of renewable energies in particular.

### Content

Introduction to Energy Economics: Characterisation (reserves, suppliers, cost, technologies) of different energy carriers (coal, gas, oil, electricity, heat etc.)

Renewable Energy - Resources, Technology and Economics: Characterisation of different renewable energy carriers (wind, solar, hydro, geothermal etc.)

Energy Policy: Management of energy flows, energy-political targets and instruments (emission trading etc.)

### Annotation

Additional study courses ( E.g. from other universities) can be transferred to the grade of the module on special request at the institute.

### Workload

The total workload for this module is approx. 270 hours (9 credits). The allocation is based on the credit points of the courses in the module. The workload for courses with 3.5 credits is approx. 105 hours, for courses with 5.5 credits approx. 165 hours.

The total number of hours per course is calculated from the time required to attend the lectures and exercises, as well as the examination times and the time required for an average student to achieve the learning objectives of the module for an average performance.

### Recommendation

The courses are conceived in a way that they can be attended independently from each other. Therefore, it is possible to start the module in winter and summer term.

## M

## 7.19 Module: Engineering Mechanics [M-MACH-101259]

**Responsible:** Prof. Dr.-Ing. Alexander Fidlin  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Engineering Sciences \(mandatory\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
3	Grade to a tenth	Each winter term	1 term	German	3	2

Mandatory			
T-MACH-102208	<a href="#">Introduction to Engineering Mechanics I: Statics and Strength of Materials</a>	3 CR	Fidlin

### Competence Certificate

The assessment consists of a written examination taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place in every semester. Re-examinations are offered at every ordinary examination date.

Permitted utilities: non-programmable calculator, literature

### Prerequisites

None

### Competence Goal

#### Professional competences:

Students will

- know and understand the basic elements of statics;
- be able to carry out simple static calculations on their own;
- know the basic concepts of strength theory: stress, strain and their relationship within the framework of elementary elasticity theory;
- know the most common strength hypotheses;
- be able to calculate independently rods, shafts and beams;
- know the classical cases of stability loss in compressed beams.

#### Interdisciplinary competences:

Students are familiar with analytical procedures and problem-oriented thinking. They are aware of the complexity of engineering problems and are able to identify and focus on the key issues within them. Students are able to use their acquired knowledge theoretical analysis of practically relevant engineering problems and to develop approaches to their solution.

### Content

Statics: force • moment • general equilibrium conditions • center of gravity • inner forces in structure • plane frameworks • adhesion

### Annotation

Starting summer 2016 the course "Introduction to Engineering Mechanics I : Statics and Strength of Materials" [2162238] will be held in summer term.

### Workload

The total workload for this module is approximately 90 hours

### Learning type

Lecture and exercises

## M

## 7.20 Module: Essentials of Finance [M-WIWI-101435]

**Responsible:** Prof. Dr. Martin Ruckes  
Prof. Dr. Marliese Uhrig-Homburg

**Organisation:** KIT Department of Economics and Management

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each summer term	1 term	German	3	3

Mandatory			
T-WIWI-102605	<a href="#">Financial Management</a>	4,5 CR	Ruckes
T-WIWI-102604	<a href="#">Investments</a>	4,5 CR	Uhrig-Homburg

**Competence Certificate**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Prerequisites**

None

**Competence Goal**

The student

- has fundamental skills in modern finance
- has fundamental skills to support investment decisions on stock, bond and derivative markets
- applies concrete models to assess investment decisions on financial markets as well as corporate investment and financing decisions.

**Content**

The module *Essentials of Finance* deals with fundamental issues in modern finance. The courses discuss fundamentals of the valuation of stocks. A further focus of this module is on modern portfolio theory and analytical methods of capital budgeting and corporate finance.

**Workload**

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.



## M

## 7.21 Module: Extracurricular Module in Engineering [M-WIWI-101404]

**Responsible:** Prüfungsausschuss der KIT-Fakultät für Wirtschaftswissenschaften  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

<b>Credits</b> 9	<b>Grading scale</b> Grade to a tenth	<b>Recurrence</b> Once	<b>Duration</b> 1 term	<b>Level</b> 3	<b>Version</b> 5
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Compulsory Elective Courses (Election: between 9 and 12 credits)			
T-WIWI-106291	PH APL-ING-TL01	3 CR	
T-WIWI-106292	PH APL-ING-TL02	3 CR	
T-WIWI-106293	PH APL-ING-TL03	3 CR	
T-WIWI-106294	PH APL-ING-TL04 ub	0 CR	
T-WIWI-106295	PH APL-ING-TL05 ub	0 CR	
T-WIWI-106296	PH APL-ING-TL06 ub	0 CR	
T-WIWI-108384	PH APL-ING-TL07	3 CR	

**Competence Certificate**

The assessment of the module is determined by the respective module coordinator. It can either be in the form of a general exam or partial exams, and must contain at least 9 credit points (max. 12 credits) and at least 6 hours per week (max. 8 hours per week). The examination may contain presentations, experiments, laboratories, term papers, etc. At least 50 percent of the module examination has to be in the form of a written or an oral examination (according to Section 4 (2), 1 or 2 of the examination regulation).

The formation of the overall grade of the module will be determined by the respective module coordinator.

**Prerequisites**

The current regulations and guidance on the procedure for applying for an extracurricular module in engineering are explained in detail at <https://www.wiwi.kit.edu/APIng-Modul.php>.

**Competence Goal**

Through the extracurricular engineering module, the student is able to deal with technical topics and issues in depth.

The concrete learning objectives are coordinated with the respective module supervisor of the module.

**Workload**

The total workload for this module is about 270 hours (9 credits). The distribution is based on the credit points of the courses completed as part of the module.

## M

## 7.22 Module: Financial Economics [M-WIWI-103120]

**Responsible:** Prof. Dr. Maxim Ulrich

**Organisation:** KIT Department of Economics and Management

**Part of:** Business Administration (Specialisation Program Business Administration)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each winter term	1 term	English	3	2

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102878	Computational Risk and Asset Management	4,5 CR	Ulrich
T-WIWI-106194	Macro-Finance	4,5 CR	Ulrich

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

None.

### Competence Goal

Students apply statistical methods to estimate expected returns, risk and risk densities of different investment instruments. They will know how to apply maximum likelihood and expectation maximization algorithms to estimate linear and non-linear asset pricing models from the fixed-income, equity or option pricing literature. Besides a conceptual understanding, students will implement the estimation algorithms using modern software and learn about current innovations in the macro-finance literature, aiming to price bonds, equity and option markets with explicitly accounting for fundamental economic and monetary policy related risks under no-arbitrage.

### Content

See respective lecture

### Annotation

See respective lecture

### Workload

The total workload for this module is approximately 270 hours. For further information, see respective lecture.

## M

## 7.23 Module: Financing and Accounting [M-WIWI-105769]

**Responsible:** Prof. Dr. Martin Ruckes  
 Dr. Jan-Oliver Strych  
 Prof. Dr. Marcus Wouters

**Organisation:** KIT Department of Economics and Management

**Part of:** [Business Administration \(mandatory\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each summer term	1 term	German	3	3

Mandatory			
T-WIWI-112820	<a href="#">Introduction to Finance and Accounting</a>	5 CR	Luedecke, Ruckes, Strych, Uhrig-Homburg, Wouters

**Competence Certificate**

The module examination is in written form. The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

**Competence Goal**

The student

- has basic knowledge in financial assessment of important business decisions and the functioning of financial markets,
- has an understanding of problems, interrelationships and solutions of internal accounting of companies,
- knows the structures and functions of external accounting,
- has an overview of important components of the annual financial statements of companies and is able to assess them economically.

With the knowledge acquired in the three basic business administration modules, the prerequisites are created in the area of business administration to expand this knowledge in the specialization program.

**Content**

The fundamentals for the financial analysis of important business decisions are taught. In addition, the fundamentals of internal and external accounting are laid and an introduction is given to accounting and the annual financial statements.

**Workload**

Total workload required for 5 credit points: approx. 150 hours

## M

## 7.24 Module: Foundations of Informatics [M-WIWI-101417]

**Responsible:** Dr.-Ing. Tobias Käfer  
Prof. Dr. Sanja Lazarova-Molnar

**Organisation:** KIT Department of Economics and Management

**Part of:** Informatics (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
10	Grade to a tenth	Each term	2 terms	German/English	3	1

Mandatory			
T-WIWI-102749	Foundations of Informatics I	5 CR	Käfer
T-WIWI-102707	Foundations of Informatics II	5 CR	Lazarova-Molnar

**Competence Certificate**

The assessment is carried out as partial exams (according to Section 4(2), 1 and 3 of the examination regulation) of the individual courses of this module.

The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. For a successful module assessment both partial exams have to be passed.

- Foundations of Informatics I: Written exam in the first week of the recess period (60 min)
- Foundations of Informatics II: Written exam in the first week of the recess period (90 min). It is possible to gain 0,3-0.4 additional grading points for a passed exam by successful completion of a bonus exam.

When both partial exams are passed, the overall grade of the module is the average of the grades for each course weighted by the credit points and truncated after the first decimal.

**Prerequisites**

None

**Competence Goal**

The student

- knows the main principles, methods and systems of computer science,
- can use this knowledge for applications in advanced computer science courses and other areas for situation-adequate problem solving,
- is capable of finding strategic and creative responses in the search for solutions to well defined, concrete, and abstract problems.

The student can deepen the learned concepts, methods, and systems of computer science in advanced computer science lectures.

**Content**

This module conveys knowledge about modeling, logic, algorithms, sorting and searching algorithms, complexity theory, problem specifications, and data structures. From the field of theoretical computer science, formal models of automata, languages and algorithms are presented and applied to the architecture of computer systems.

**Workload**

The total workload for this module is approximately 300 hours.

**Recommendation**

It is strongly recommended to attend the courses of the core program in the following sequence: *Introduction to Programming with Java, Foundations of Informatics I, Foundations of Informatics II*

## M

## 7.25 Module: Foundations of Marketing [M-WIWI-101424]

**Responsible:** Prof. Dr. Martin Klarmann

**Organisation:** KIT Department of Economics and Management

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	8

Mandatory			
T-WIWI-102805	<a href="#">Managing the Marketing Mix</a>	4,5 CR	Klarmann
Supplementary Courses (Election: at least 4,5 credits)			
T-WIWI-111367	<a href="#">B2B Sales Management</a>	4,5 CR	Klarmann
T-WIWI-112156	<a href="#">Brand Management</a>	4,5 CR	Kupfer
T-WIWI-106569	<a href="#">Consumer Behavior</a>	4,5 CR	Scheibehenne

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

The course *Marketing Mix* is compulsory and must be examined.

### Competence Goal

The aim of this module is to prepare students for a job in marketing or sales. Especially in technically oriented companies, employees who have a certain technical background as industrial engineers or business informatics specialists are often fit for this purpose.

Students

- are familiar with the most important concepts, procedures and theories of the four instruments of the marketing mix (product management, price management, communication management and sales management)
- have the knowledge to make decisions regarding current and future products (product innovations, e.g. by using conjoint analysis)
- know how customers perceive brands and how this perception can be influenced by the company
- understand how customers react to prices (e.g. using price-sales functions)
- can determine prices on the basis of conceptual and quantitative considerations
- know the basics of price differentiation
- are familiar with various communication instruments (e.g. TV advertising) and can design them accurately
- make communication decisions systematically (e.g. by means of media planning)
- can segment the market and position the product
- know how to assess the importance and satisfaction of customers.

Additionally when taking the course "B2B Sales Management":

- can shape the relationship with customers and sales partners and know the basics of sales organization as well as essential sales channel decisions
- know about specifics of marketing in B2B
- are able to identify different B2B business types and their peculiarities in marketing and sales
- are able to prioritize customers and calculate B2B customer lifetime value
- are able to determine value-based prices and prepare and conduct B2B sales presentations.

Additionally when taking the course "Consumer Behavior":

- know about the influences of social factors, neuronal processes and cognitive resources on consumer behavior
- know about the influences of evolutionary factors, emotions, individual differences and motivation on consumer behavior.

**Content**

The core course of the module is "Marketing Mix". This course is compulsory and must be examined. "Marketing Mix" contains instruments and methods that enable you to goal-oriented decisions in the operative marketing management (product management, pricing, promotion and sales management). In the "B2B Sales Management" course, we impart knowledge about marketing and sales in environments in which companies themselves distribute and market (often technically highly complex) products to other companies ("business-to-business"). In the "Consumer Behavior" course, we provide an understanding of situational, biological, cognitive, and evolutionary factors that influence consumer behavior. This understanding is provided from an interdisciplinary perspective, incorporating relevant theories and empirical research findings from psychology, cognitive science, biology, and economics.

**Annotation**

The courses "Services Marketing and B2B Marketing" and "International Marketing" were offered for the last time in the winter semester 2020/21 and will be replaced by the course "B2B Sales Management" from the winter semester 2021/22 on. The course "Marketing Mix" will continue to be offered as normal in the summer semester 2021 and will also be retained in the long term. For further information please contact the Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

**Workload**

Total effort for 9 credit points: approx. 270 hours.

The exact distribution is done according to the credit points of the courses of the module.

## M

## 7.26 Module: Fundamentals of Construction [M-BGU-101004]

**Responsible:** Prof. Dr.-Ing. Shervin Haghsheno

**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German	3	2

Mandatory			
T-BGU-101691	Construction Technology	6 CR	Haghsheno
T-BGU-101675	Project Management	3 CR	Haghsheno

#### Prerequisites

none

#### Competence Goal

The student

- is familiar with all substantial domains of construction
- knows and understands substantial construction methods and construction machines
- masters basic construction calculations
- knows and understands the fundamentals of project management in civil engineering
- can apply his / her knowledge in a goal-oriented manner to accomplish a construction project efficiently

#### Annotation

We encourage students to deepen their knowledge in construction by building additional customized modules from the courses offered by TMB. Please consult with the tutors of this module. Further information is available at [www.tmb.kit.edu](http://www.tmb.kit.edu).

#### Recommendation

None

## M

## 7.27 Module: Fundamentals of Digital Service Systems [M-WIWI-102752]

**Responsible:** Prof. Dr. Gerhard Satzger  
Prof. Dr. Christof Weinhardt

**Organisation:** KIT Department of Economics and Management

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German	3	7

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-111307	<a href="#">Digital Services: Foundations</a>	4,5 CR	Satzger, Vössing
T-WIWI-109816	<a href="#">Foundations of Interactive Systems</a>	4,5 CR	Mädche
T-WIWI-110888	<a href="#">Practical Seminar: Digital Services</a>	4,5 CR	Satzger

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO), whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

None

### Competence Goal

Students

- understand services from different perspectives and the concept of value creation in service networks
- know about the concepts, methods and tools for the design, modelling, development and management of digital services and are able to use them
- understand the basic characteristics and effects of integrated information system as a an integral element of digital services
- gain experience in group work as well as in the analysis of case studies and the professional presentation of research results
- practice skills in the English language in preparation of jobs in an international environment

### Content

Global economy is increasingly determined by services: in industrialized countries nearly 70% of gross value added is achieved in the tertiary sector. Unfortunately, for the design, development and the management of services traditional concepts focused on goods are often insufficient or inappropriate. Besides, the rapid technical advance in the information and communication technology sector pushesthe economic importance of digital services even further thus changing the competition environment. ICT-based interaction and individualization open up completely new dimensions of shared value between clients and providers, dynamic and scalable "service value networks" replace established value chains, digital services are provided globally crossing geographical boundaries. This module establishes a basis for further specialization in service innovation, service economics, service design, service modelling, service analytics as well as the transformation and coordination of service networks.

### Annotation

This module is part of the KSRI teaching profile "Digital Service Systems". Further information on a service-specific profiling is available under [www.ksri.kit.edu/teaching](http://www.ksri.kit.edu/teaching).

### Workload

Total workload for 9 credit points: approx. 270 hours. The allocation is based on the credit points of the courses in the module.

### Recommendation

None



## M

## 7.28 Module: Handling Characteristics of Motor Vehicles [M-MACH-101264]

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	4	6

Vehicle Properties (Election: at least 9 credits)			
T-MACH-105152	Handling Characteristics of Motor Vehicles I	3 CR	Unrau
T-MACH-105153	Handling Characteristics of Motor Vehicles II	3 CR	Unrau
T-MACH-102156	Project Workshop: Automotive Engineering	4,5 CR	Frey, Gauterin, Gießler

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

None

### Competence Goal

The student

- knows and understands the characteristics of vehicles, owing to the construction and design tokens,
- knows and understands especially the factors being relevant for comfort and acoustics
- is capable of fundamentally evaluating and rating handling characteristics.

### Content

See courses.

### Workload

The total work load for this module is about 270 Hours (9 Credits). The partition of the work load is carried out according to the credit points of the courses of the module. The work load for courses with 4.5 credit points is about 135 hours, and for courses with 3 credit points about 90 hours. The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam duration and the time that is required to achieve the objectives of the module as an average student with an average performance.

### Recommendation

Knowledge of the content of the courses *Engineering Mechanics I* [2161238], *Engineering Mechanics II* [2162276] and *Basics of Automotive Engineering I* [2113805], *Basics of Automotive Engineering II* [2114835] is helpful.

## M

## 7.29 Module: HR Management &amp; Digital Workplace [M-WIWI-105928]

**Responsible:** Prof. Dr. Alexander Mädche  
Prof. Dr. Petra Nieken

**Organisation:** KIT Department of Economics and Management

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	3	2

Elective Offer (Election:)			
T-WIWI-113745	<a href="#">HR-Management 1: HR Strategies in the Age of AI</a>	4,5 CR	Nieken
T-WIWI-111858	<a href="#">Topics in Human Resource Management</a>	3 CR	Nieken
T-WIWI-109816	<a href="#">Foundations of Interactive Systems</a>	4,5 CR	Mädche
T-WIWI-111914	<a href="#">Practical Seminar: Interactive Systems</a>	4,5 CR	Mädche

### Competence Certificate

The assessment is carried out as partial exams of the courses in this module. The assessment procedures are described for each course in the module separately.

The overall grade of the module is the average of grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

Please refer to the course descriptions for potential restrictions regarding an individual course.

### Competence Goal

The student

- understands and analyses challenges and objectives within organizations
- applies economic models and empirical methods to analyze and solve challenges with a focus on the future of work
- understands the impact of digitalization and new information and communication technology on the work life and HR decisions
- knows how to apply scientific research methods and understands the underlying problems

### Content

The module „HR Management & Digital Workplace” offers an interdisciplinary approach and brings together knowledge about Human Resource Management, Leadership and Digitalization. The module specifically focuses on topics related to the future of work in organizations. The topics range from interactive systems at the digital workplace and human-centered design, to recruiting, training and development, as well as (digital) leadership. All courses in the module foster active participation and allow students to learn state-of-the-art concepts and methods and apply them to real-world challenges.

### Annotation

Please refer to the course descriptions for potential restrictions regarding an individual course.

### Workload

Total workload for 9 credits: approx. 270 hours.

## M

## 7.30 Module: Industrial Production I [M-WIWI-101437]

**Responsible:** Prof. Dr. Frank Schultmann

**Organisation:** KIT Department of Economics and Management

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	3	4

Mandatory			
T-WIWI-102606	<a href="#">Fundamentals of Production Management</a>	5,5 CR	Schultmann
Supplementary Courses (Election: 3,5 credits)			
T-WIWI-102870	<a href="#">Logistics and Supply Chain Management</a>	3,5 CR	Schultmann
T-WIWI-102820	<a href="#">Production Economics and Sustainability</a>	3,5 CR	Schultmann, Volk

### Competence Certificate

The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course "Fundamentals of Production Management" [2581950] and one further single course of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

The course "Fundamentals of Production Management" [2581950] and one additional activity have to be chosen.

### Competence Goal

- Students shall be aware of the important role of industrial production and logistics for production management.
- Students shall use relevant concepts of production management and logistics in an adequate manner.
- Students shall be able to reflect on decision principles in firms and their circumstances in the light of the production management aspects studied.
- Students shall be proficient in describing essential tasks, difficulties and solutions to problems in production management and logistics
- Students shall be able to describe relevant approaches of modeling production and logistic systems.
- Students shall be aware of the important role of material and energy-flows in production systems.
- Students shall be proficient in using exemplary methods for solving selected problems.

### Content

This module is designed to introduce students into the wide area of industrial production and logistics management. It focuses on strategic production management under the aspect of sustainability. The courses use interdisciplinary approaches of systems, also theory to describe the central tasks of industrial production management and logistics. Herein, attention is drawn upon strategic corporate planning, research and development as well as site selection. Students will obtain knowledge in solving internal and external transport and storage problems with respect to supply chain management and disposal logistics.

### Workload

Total effort will account to 270 hours (9 credit points) and can be allocated according to the credit point rating. Therefore, a course with 3.5 credits requires an effort of approximately 105h and a course with 5.5 credits 165h.

The total effort for each course consists of attending lectures and tutorials, examination times and the time an average student needs to prepare himself in order to pass the exam with an average grade.

## M

## 7.31 Module: Information Systems &amp; Digital Business [M-WIWI-105981]

**Responsible:** Prof. Dr. Alexander Mädche  
Prof. Dr. Gerhard Satzger  
Prof. Dr. Christof Weinhardt

**Organisation:** KIT Department of Economics and Management

**Part of:** Business Administration (Specialisation Program Business Administration)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	3	2

Compulsory Elective Courses (Election: at least 1 item)			
T-WIWI-106569	Consumer Behavior	4,5 CR	Scheibehenne
T-WIWI-111307	Digital Services: Foundations	4,5 CR	Satzger, Vössing
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-109816	Foundations of Interactive Systems	4,5 CR	Mädche
T-WIWI-107506	Platform Economy	4,5 CR	Weinhardt
Complementary Offer (Election: at most 1 item)			
T-WIWI-110888	Practical Seminar: Digital Services	4,5 CR	Satzger
T-WIWI-111914	Practical Seminar: Interactive Systems	4,5 CR	Mädche
T-WIWI-112154	Practical Seminar: Platform Economy	4,5 CR	Weinhardt

### Competence Certificate

The module examination takes place in the form of partial examinations via courses of the module amounting to a total of at least 9 LP.

The overall score of the module is formed from the credit-weighted scores of the partial examinations and truncated after the first decimal place.

### Competence Goal

Students

- understand the basic concepts of interactive systems as well as the economic foundations and key components of platforms
- explore the theoretical grounding of interactive systems leveraging theories from reference disciplines such as psychology
- understand business models, network effects of digital platforms and get to know different market forms and market mechanisms
- gain experience in group work as well as in the analysis of case studies and the professional presentation of research results

**Content**

The “Information Systems & Digital Business” modules of the research groups of Prof. Dr. Alexander Mädche (Information Systems & Service Design), Prof. Dr. Gerhard Satzger (Digital Service Innovation) and Prof. Dr. Christof Weinhardt (Information & Market Engineering), offer a comprehensive overview on important topics of digitalization – blending aspects of digital interaction, digital services and the platform economy. Courses in this module cover the aspects of interaction between humans and information systems as well as the economic foundations of platform businesses:

**Foundations of Interactive Systems:**

Advanced information and communication technologies (ICT) make interactive systems ever-present in the users’ private and business life. They are an integral part of E-Commerce portals or social networking sites as well as at the workplace, e.g. in the form of collaboration portals or analytical dashboards. Furthermore, with the ever-increasing capabilities of ICT, the design of human-computer interaction is becoming increasingly important. The aim of this module is to introduce the foundations, related theories, key concepts, and design principles as well as current practice of contemporary interactive systems. The students get the necessary knowledge to guide the successful implementation of interactive systems in business and private life.

**Platform Economy:**

Apple, Alphabet, Amazon, Microsoft, and Facebook; five of the most valuable companies worldwide create large portions of their profits by employing a digital platform model. This module teaches the key design considerations of digital platforms: their foundations in economic theory, their core components and design aspects, the adequate selection of market mechanisms for achieving certain goals, and the role of user behavior in the context of digital platforms. The theoretic foundations are enriched by discussions of several real-world examples, e.g. from the finance sector. Thus, the students are enabled to a) analyze given platforms and make recommendations for improvements and b) independently design new platforms for given use cases.

**Consumer Behavior:**

Consumer decisions are ubiquitous in daily life and they can have long-ranging and important consequences for individual (financial) well-being and health but also for societies and the planet as a whole. To help people to make better choices it is important to understand the factors that influence their behavior. Towards this goal, we will explore how consumer behavior is shaped by social influences, situational and cognitive constraints, as well as by emotions, motivations, evolutionary forces, neuronal processes, and individual differences. Across all topics covered in class, we will engage with basic theoretical work as well as with groundbreaking empirical research and current scientific debates. The lecture will be held in English.

**Annotation**

The module can no longer be taken as of winter semester 2022/2023.

**Workload**

Total effort for 9 credit points: approx. 270 hours. The distribution is based on the credit points of the courses of the module (120-135h for courses with 4.5 credit points). The total number of hours per course results from the effort required to attend lectures and exercises, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

## M

## 7.32 Module: Integrated Production Planning [M-MACH-101272]

**Responsible:** Prof. Dr.-Ing. Gisela Lanza  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each summer term	1 term	German	3	3

Mandatory			
T-MACH-109054	Integrated Production Planning in the Age of Industry 4.0	9 CR	Lanza

**Competence Certificate**

Written Exam (120 min)

**Prerequisites**

none

**Competence Goal**

The students

- can discuss basic questions of production technology.
- are able to apply the methods of integrated production planning they have learned about to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about for a specific problem.
- can apply the learned methods of integrated production planning to new problems.
- can use their knowledge targeted for efficient production technology.

**Content**

Within this engineering sciences-oriented module the students will get to learn principle aspects of organization and planning of production systems.

**Workload**

regular attendance: 63 hours

self-study: 207 hours

**Learning type**

Lecture, exercise, excursion

## M

## 7.33 Module: Internship [M-WIWI-101419]

**Responsible:** Studiendekan des KIT-Studienganges  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Internship](#)

Credits	Grading scale	Recurrence	Duration	Level	Version
10	pass/fail	Once	1 term	3	2

Mandatory			
T-WIWI-102611	<a href="#">Internship</a>	10 CR	Studiendekan des KIT-Studienganges

**Competence Certificate**

The assessment is carried out by the evidence of completed full-time internships of at least 12 weeks with at least 20 working hours per week and a presentation of the internship in the form of a written report on the activities. The internship is not graded.

## 1. Information on evidence of completed full-time internships:

The internship is proofed by the certificate of the intern's office. The certificate has to be formally correct with official corporate letterhead and handwritten countersigned by a responsible employee of the company.

The certificate must at least contain the following information:

- \* Company / Location
- \* Duration: from ... to ...
- \* Hours of work (weekly)
- \* Working interruption, indicating the vacation and sick days
- \* Department
- \* Headwords to the activities

## 2. Information on to the presentation:

The internship report should be at least one page (typewritten, not handwritten) for each Location. It must be countersigned by a representative of the intern's office.

**Prerequisites**

None

**Competence Goal**

- has general insight into the essential processes in a company,
- is in a position to identify operation correlations and has the knowledge and skills to facilitate a fast understanding of the processes in the company,
- in addition to practical professional experience and competences, also has key competences such as own initiative, ability to work in a team and communication skills as well as ability to integrate into corporate hierarchies and procedures,
- has the experience to accomplish complex IT and business tasks under realistic conditions within the framework of the relevant legal aspects and while applying the total acquired knowledge (interlaced thinking),
- has an idea of the professional development potential in the economy through pursuit of study-related activities,
- knows the technical and professional requirements in the individually targeted future occupation and can take this knowledge into account for the future planning of his/her studies and career,
- can assess and estimate own technical and professional strengths and weaknesses through his/her evaluation of the company.

**Content**

The internship may be done in economic, business and/or technical companies. At best, it is done on activities which are located at the intersection of the two fields - getting to know the specific requirements of Industrial Engineering and Management.

A commercial internship provides an insight into business or administrative processes of business transactions. Therefore departments such as controlling, organizing, marketing and planning appear particularly suitable.

Work experiences in the departments of engineering, work preparation and provision of material or IT cover more technical aspects of the internship. But work experiences in an engineering firm go with a technical internship.

It remains the companies and interns left, which stations and areas the intern will eventually go through. But the focus should always be in accordance with operational realities of the company.

**Annotation**

Internships, that were completed even before studying may be recognized, if the criteria for recognition are met. After recognition of the compulsory internship, there can be taken a semester off for a voluntary, student-related internship.

Regarding to the election of the company, in which the internship is completed, there are no specific rules. With a view to the future professional career, it is recommended to absolve the internship in a larger, possibly international company.

Vacation days are not figured into the internship.

Only three sick leave days may incurred at all. Any additional sick days are not figured into the internship.

A relevant vocational education of at least two years is accepted as a performance equivalent to the internship.

**Workload**

The total workload for this module is approximately 300 hours.



## M

## 7.34 Module: Introduction to Economics [M-WIWI-101398]

**Responsible:** Prof. Dr. Clemens Puppe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Economics (mandatory)

**Credits**  
10

**Grading scale**  
Grade to a tenth

**Recurrence**  
Each term

**Duration**  
2 terms

**Level**  
3

**Version**  
1

Mandatory			
T-WIWI-102708	<a href="#">Economics I: Microeconomics</a>	5 CR	Puppe, Reiß
T-WIWI-102709	<a href="#">Economics II: Macroeconomics</a>	5 CR	Wigger

### Competence Certificate

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module. The assessment procedures of each course of this module is defined for each course separately.

### Competence Goal

The student

- knows and understands basic economic problems,
- understands economic policy in globalized markets,
- is able to develop elementary solution concepts.

The lectures of this module have different focuses: In Economics I, economic problems are seen as decision problems, Economics II treats the dynamics of economic processes.

### Content

The basic concepts, methods and models of micro- and macroeconomics are treated. The course *Economics I: Microeconomics [2600012]* deals with micro-economic decision theory, questions of market theory and problems of imperfect competition and with basic principles of game theory and welfare economics. *Economics II: Macroeconomics [2600014]* discusses economic organization models and national accounts as well as the question of international trade and monetary policy. Furthermore, the complex growth, boom and economic speculations are dealt with.

### Module grade calculation

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Annotation

**Notice:** The lecture *Economics I: Microeconomics [2600012]* is part of the preliminary examination concerning § 8(1) of the examination regulation in the study programs Industrial Engineering and Management B.Sc. and Economics Engineering B.Sc.. This examination must be passed until the end of the examination period of the second semester. Any Re-examinations has to be passed until the end of the examination period of the third semester. Otherwise the examination claim will be lost.

### Workload

See German version.

## M

## 7.35 Module: Introduction to Natural Hazards and Risk Analysis [M-WIWI-104838]

**Responsible:** apl. Prof. Dr. Michael Kunz

**Organisation:** KIT Department of Economics and Management

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	4

Compulsory Elective Courses (Election: at least 9 credits)			
T-BGU-101500	Introduction to Engineering Geology	5 CR	Blum
T-BGU-103541	Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite	3 CR	Wursthorn
T-BGU-101681	Introduction to GIS for Students of Natural, Engineering and Geo Sciences	3 CR	Wursthorn
T-BGU-101637	Systems of Remote Sensing, Prerequisite	1 CR	Cermak, Hinz, Weidner
T-BGU-101638	Procedures of Remote Sensing, Prerequisite	1 CR	Weidner
T-BGU-101636	Remote Sensing, Exam	4 CR	Cermak, Hinz, Weidner
T-BGU-103542	Procedures of Remote Sensing	3 CR	Weidner
T-PHYS-103525	Geological Hazards and Risk	8 CR	Schäfer
T-BGU-101693	Hydrology	4 CR	Zehe
T-PHYS-101092	Climatology	1 CR	Ginete Werner Pinto
T-BGU-101814	Project in Applied Remote Sensing	1 CR	Hinz, Weidner
T-PHYS-105594	Exam on Climatology	5 CR	Ginete Werner Pinto
T-BGU-101667	Hydraulic Engineering and Water Management	4 CR	Rodrigues Pereira da Franca

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

There are no singular exams for Remote Sensing Systems [20241/42] and Remote Sensing Methods [20265/66]. Therefore it not possible to choose Remote Sensing [GEOD-BFB-1] and additionally the courses Remote Sensing Systems, Remote Sensing Methods or the project Angewandte Fernerkundung [20267] (because they are already included). See also "Recommendations".

### Competence Goal

The student possesses

- knowledge of various extreme events (meteorological, hydrological, geophysical) and their characteristics and causes
- an improved understanding of natural disasters, their causes and effects from an interdisciplinary perspective
- knowledge of methods of early warning and/or prediction of extreme natural events, as well as possible prevention and precautionary measures.

### Content

The courses in this module primarily deal with scientific and engineering aspects of extreme events and natural disasters. The overarching aim of the module is to gain a better understanding of risk as a complex interaction of different mechanisms and processes. Contributions from meteorology, geophysics and hydrology enable an interdisciplinary understanding of extreme events and disasters. The teaching of methodological knowledge (e.g. meteorological, hydrological or geophysical measurement methods) is of great importance. These also include methods of hazard analysis and forecasting and/or early warning with the aim of significantly reducing the exposure and vulnerability of people, critical infrastructure and technical or biological systems and thus the impact of extreme events.

**Annotation**

As a precaution, we would like to point out that the lecture belonging to the "Climatology" [T-PHYS-101092] has the number 4051111 and is read by Mr. Pinto. The lecture of the same name by Mr. Hogewind (6111031) does not belong to this course and is not creditable in this module.

**Information on the course "Geological Hazards and Risk":**

**Language:** English

**Content:**

- Earthquake Hazards
  - Short introduction to seismology and seismometry (occurrence of tectonic earthquakes, types of seismic waves, magnitude, intensity, source physics)
  - Induced seismicity
  - Engineering seismology, Recurrence intervals, Gutenberg-Richter, PGA, PGV, spectral acceleration, hazard maps
  - Earthquake statistics
  - Liquefaction
- Tsunami Hazards
- Landslide Hazards
- Hazards from Sinkholes
- Volcanic Hazards
  - Short introduction to physical volcanology
  - Types of volcanic hazards
- The Concept of Risk, Damage and Loss
- Data Analysis and the use of GIS in Risk analysis
- Risk Modelling - Scenario Analysis
- Risk Reduction and Risk Management
- Analysis Feedback and Prospects in the Risk Modelling Industry

**Learning outcomes:**

The students understand basic concepts of hazard and risk. They can explain in detail different aspects of earthquake hazard, volcanic hazard as well as other geological hazards, can compare and evaluate those hazards. They have fundamental knowledge of risk reduction and risk management. They know methods of risk modelling and are able to apply them.

**Examination:** Active and regular attendance of lecture and practicals. Project work (graded).

**Workload:**

60 h: active attendance during lectures and exercises  
 90 h: review, preparation and weekly assignments  
 90 h: project work

**Workload**

The total workload for this module is approximately 270 hours.

**Recommendation**

The courses Remote Sensing Systems [20241/42] and Remote Sensing Methods [20265/66] may be chosen as a minimal combination for the exam. However, it is recommended to choose the comprehensive combination Remote Sensing [GEOD-BFB-1], which includes Remote Sensing Systems [20241/42], Remote Sensing Methods [20265/66] and the project Angewandte Fernerkundung [20267].

## M

## 7.36 Module: Introduction to Operations Research [M-WIWI-101418]

**Responsible:** Prof. Dr. Stefan Nickel  
 Prof. Dr. Steffen Rebennack  
 Prof. Dr. Oliver Stein

**Organisation:** KIT Department of Economics and Management

**Part of:** [Operations Research \(mandatory\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each summer term	2 terms	German	3	2

Mandatory			
T-WIWI-102758	<a href="#">Introduction to Operations Research I and II</a>	9 CR	Nickel, Rebennack, Stein

**Competence Certificate**

The assessment of the module is carried out by a written examination (120 minutes). In each term (usually in March and August), one examination is held for both courses.

**Prerequisites**

None

**Competence Goal**

The student

- names and describes basic notions of the essential topics in Operations Research (Linear programming, graphs and networks, integer and combinatorial optimization, nonlinear programming, dynamic programming and stochastic models),
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve optimization problems independently,
- validates, illustrates and interprets the obtained solutions.

**Content**

This module treats the following topics: linear programming, network models, integer programming, nonlinear programming, dynamic programming, queuing theory, heuristic models.

This module forms the basis of a series of advanced lectures with a focus on both theoretical and practical aspects of Operations Research.

**Module grade calculation**

The overall grade of the module is the grade of the written examination.

**Workload**

The total workload for this module is approx. 270 hours (attendance time: 85 hours, other time for preparation and follow-up as well as exam preparation: 185 hours, 9 credit points).

The total workload of 9 credit points is divided into approx. 3.5 credit points in the first semester and 5.5 credit points in the second semester.

The total number of hours per course is calculated from the time required to attend lectures and tutorials, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

## M

## 7.37 Module: Introduction to Programming [M-WIWI-101581]

**Responsible:** Prof. Dr.-Ing. Johann Marius Zöllner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Informatics (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each winter term	1 term	German	3	1

Mandatory			
T-WIWI-102735	Introduction to Programming with Java	5 CR	Zöllner

**Competence Certificate**

The assessment consists of a written resp. computer-based exam (60 min) according to Section 4 (2),1 of the examination regulation.

The successful completion of the compulsory tests in the computer lab is prerequisites for admission to the written resp. computer-based exam.

The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

**Competence Goal**

- Knowledge of the fundamental principles, methods and systems of informatics.
- Students acquire the ability to independently solve algorithmic problems in the programming language Java, which is predominant in the field of business applications.
- This enables them to find strategic and creative answers in the search for solutions to precisely defined, concrete and abstract problems.

**Content**

With an introduction to systematic programming, the module provides essential practical foundations for all advanced computer science lectures. Based on considerations on the structured and systematic design of algorithms, the most important constructs of modern higher programming languages and programming methods are explained and illustrated using examples. One focus is on teaching the concepts of object-oriented programming. Java is used as the programming language. Knowledge of this language is assumed in the advanced computer science lectures.

**Workload**

Total workload for 5 credit points: approx. 150 hours

Attendance time: 45 hours

Preparation and follow-up of the course: 67.5 hours

Exam and exam preparation: 37.5 hours

## M

## 7.38 Module: Introduction to Statistics [M-WIWI-101432]

**Responsible:** Prof. Dr. Oliver Grothe  
Prof. Dr. Melanie Schienle

**Organisation:** KIT Department of Economics and Management

**Part of:** [Statistics](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
10	Grade to a tenth	Each term	2 terms	German	3	2

Mandatory			
T-WIWI-102737	<a href="#">Statistics I</a>	5 CR	Grothe, Schienle
T-WIWI-102738	<a href="#">Statistics II</a>	5 CR	Grothe, Schienle

**Competence Certificate**

The assessment of this module consists of two written examinations according to Section 4(2), 1 of the examination regulation (one for each of the courses [Statistics I](#) and [II](#)).

The overall grade of the module is the average of the grades of these two written examinations.

**Prerequisites**

**Notice:** The lecture [Statistics I](#) [25008/25009] is part of the preliminary examination concerning Section 8(1) of the examination regulation. This examination must be passed until the end of the examination period of the second semester. Any Re-examinations has to be passed until the end of the examination period of the third semester. Otherwise the examination claim will be lost.

**Competence Goal**

The student

- knows and understands the basic concepts of statistical data analysis and applies them independently to limited objects of investigation,
- knows and understands the basic definitions and statements of probability theory and applies them independently,
- transfers the theoretical foundations of statistical data analysis and probability theory to the issues of parametric estimation and test theory.

**Content**

The module contains the fundamental methods and scopes of Statistics.

A. Descriptive Statistics: univariate und bivariate analysis

B. Probability Theory: probability space, conditional and product probabilities, transformation of probabilities, parameters of location and dispersion, most important discrete and continuous distributions, covariance and correlation, limit distributions

C. Theory of estimation and testing: sufficiency of statistics, point estimation (optimality, ML-method), interval estimations, linear regression

**Module grade calculation**

The overall grade of the module is the average of the grades of these two written examinations.

**Workload**

The total workload for this module is approx. 300 hours (10 credits). The distribution is based on the credit points of the courses of the module.

The total number of hours per course is calculated from the time required to attend the lectures and exercises, the examination time and the time required for an average student to achieve the learning objectives of the module for an average performance.

**Recommendation**

It is strongly recommended to complete the course [Statistics I](#) [25008/25009] before the course [Statistics II](#) [25020/25021].

The lecture is accompanied by an exercise and a tutorial as well as a computer practical course, which are recommended.

## M

## 7.39 Module: Leadership &amp; Sustainable HR-Management [M-WIWI-106860]

**Responsible:** Prof. Dr. Petra Nieken

**Organisation:** KIT Department of Economics and Management

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German	3	3

Mandatory			
T-WIWI-113745	<a href="#">HR-Management 1: HR Strategies in the Age of AI</a>	4,5 CR	Nieken
Elective Offer (Election: )			
T-WIWI-102908	<a href="#">Personnel Policies and Labor Market Institutions</a>	4,5 CR	Nieken
T-WIWI-111858	<a href="#">Topics in Human Resource Management</a>	3 CR	Nieken

### Competence Certificate

The assessment is carried out as partial exams according to § 4 paragraph 2 Nr. 1 – Nr. 3 SPO of the examination regulation of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Competence Goal

The student

- understands and analyzes relevant processes, methods, and instruments in HR management and leadership, evaluating their usefulness,
- analyzes various processes and assesses their strengths and weaknesses, particularly regarding the use of AI in the workplace and sustainability aspects,
- understands the current challenges in HR management and leadership, considering their alignment with corporate strategy,
- evaluates the strengths and weaknesses of existing structures and regulations based on systematic criteria,
- possesses knowledge of the applicability and challenges of different scientific research methods.

### Content

The module provides comprehensive knowledge in the areas of sustainable HR management, leadership, fair working conditions, and diversity and inclusion. Students engage deeply with the future of work. Topics range from classic HR themes such as recruiting and employee retention to AI in the workplace, fair working conditions, and sustainability.

Drawing on microeconomic and behavioral economic approaches, we analyze various processes and instruments, evaluating their alignment with corporate strategy. All courses within the module encourage active participation and empower students to learn cutting-edge concepts and methods, applying them to real-world challenges

### Workload

Total workload for 9 credits: approx. 270 hours.

### Recommendation

Completion of the core module "Management and Marketing" is recommended.

There is no fixed order for the courses of this module.

## M

## 7.40 Module: Logistics and Supply Chain Management [M-MACH-105298]

**Responsible:** Prof. Dr.-Ing. Kai Furmans

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each summer term	1 term	English	3	2

Mandatory			
T-MACH-110771	Logistics and Supply Chain Management	9 CR	Furmans

### Competence Certificate

The assessment consists of a 120 minutes written examination (according to §4(2), 1 of the examination regulation).

### Prerequisites

None

### Competence Goal

The student

- has comprehensive and well-founded knowledge of the central challenges in logistics and supply chain management, an overview of various practical issues and the decision-making requirements and models in supply chains,
- can model supply chains and logistics systems using simple models with sufficient accuracy,
- identifies cause-effect relationships in supply chains,
- is able to evaluate supply chains and logistics systems based on the methods they have mastered.

### Content

Logistics and Supply Chain Management provides comprehensive and well-founded fundamentals for the crucial issues in logistics and supply chain management. Within the scope of the lectures, the interaction of different design elements of supply chains is emphasized. For this purpose, qualitative and quantitative description models are used. Methods for mapping and evaluating logistics systems and supply chains are also covered. The lecture contents are enriched by exercises and case studies and partially the comprehension of the contents is provided by case studies. The interacting of the elements will be shown, among other things, in the supply chain of the automotive industry.

### Module grade calculation

grade of the module is grades of the exam

### Workload

contact hours (1 HpW = 1 h x 15 weeks):

- lecture: 60 h

independent study:

- preparation and follow-up lectures: 90 h
- preparation of case studies: 60 h
- examination preparation: 60 h

total: 270 h

### Recommendation

none

### Learning type

Lectures, tutorials, case studies.



**Literature**

Knut Aliche: Planung und Betrieb von Logistiknetzwerken: Unternehmensübergreifendes Supply Chain Management, 2003

Dieter Arnold et. al.: Handbuch Logistik, 2008

Marc Goetschalkx: Supply Chain Engineering, 2011

## M

## 7.41 Module: Machine Learning and Data Science [M-WIWI-105482]

**Responsible:** Prof. Dr. Andreas Geyer-Schulz

**Organisation:** KIT Department of Economics and Management

**Part of:** Business Administration (Specialisation Program Business Administration)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	3	1

Mandatory			
T-WIWI-111028	Introduction to Machine Learning	4,5 CR	Geyer-Schulz, Nazemi
T-WIWI-111029	Introduction to Neural Networks and Genetic Algorithms	4,5 CR	Geyer-Schulz

### Competence Certificate

The module examination is carried out in the form of partial examinations of the selected courses of the module, with which in total the minimum requirement of credit points is fulfilled. The kind of examination is described in detail for each course of this module.

### Prerequisites

None

### Competence Goal

The student

- knows the main families of machine learning methods, their basic principles, assumptions and restrictions.
- can use these methods to solve data analysis problems, to support decision making or for process automation in companies and use the solutions interpreted and evaluated accordingly.
- can compare and evaluate the performance of solutions.

### Content

The module mainly focuses on methods from statistical learning (linear and logistic learning, regression, tree methods, SVMs, and shrinkage estimators) and from the field of neural and genetic procedures were presented. Furthermore, data transformations and -representations (e.g. dimension reduction, clustering, imputation in case of missing data) and visualization techniques and appropriate inference, diagnosis and validation techniques are presented.

### Workload

Total effort for 9 credit points: approx. 270 hours. The allocation is based on the credit points of the courses of the module.

## M

## 7.42 Module: Machine Tools and Industrial Handling [M-MACH-101286]

**Responsible:** Prof. Dr.-Ing. Jürgen Fleischer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each winter term	1 term	German	4	5

Mandatory			
T-MACH-110963	Machine Tools and High-Precision Manufacturing Systems	9 CR	Fleischer

**Competence Certificate**

Oral exam (45 minutes)

**Prerequisites**

None

**Competence Goal**

The students

- are able to assess the use and application of machine tools and high-precision manufacturing systems and to differentiate between them in terms of their characteristics and design.
- can describe and discuss the essential elements of machine tools and high-precision manufacturing systems (frame, main spindle, feed axes, peripheral equipment, control unit).
- are able to select and dimension the essential components of machine tools and high-precision manufacturing systems.
- are capable of selecting and evaluating machine tools and high-precision manufacturing systems according to technical and economic criteria.

**Content**

The module gives an overview of the construction, use and application of machine tools and high-precision manufacturing systems. In the course of the module a well-founded and practice-oriented knowledge for the selection, design and evaluation of machine tools and high-precision manufacturing systems is conveyed. First, the main components of the systems are systematically explained and their design principles as well as the integral system design are discussed. Subsequently, the use and application of machine tools and high-precision manufacturing systems will be demonstrated using typical machine examples. Based on examples from current research and industrial applications, the latest developments are discussed, especially concerning the implementation of Industry 4.0 and artificial intelligence.

Guest lectures from industry round off the module with insights into practice.

The individual topics are:

- Structural components of dynamic manufacturing Systems
- Feed axes: High-precision positioning
- Spindles of cutting machine Tools
- Peripheral Equipment
- Machine control unit
- Metrological Evaluation
- Maintenance strategies and condition Monitoring
- Process Monitoring
- Development process for machine tools and high-precision manufacturing Systems
- Machine examples

**Workload**

regular attendance: 63 hours

self-study: 207 hours

**Learning type**

Lecture, exercise, excursio

## M

## 7.43 Module: Management Accounting [M-WIWI-101498]

**Responsible:** Prof. Dr. Marcus Wouters

**Organisation:** KIT Department of Economics and Management

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	English	3	3

Mandatory			
T-WIWI-102800	<a href="#">Management Accounting 1</a>	4,5 CR	Wouters
T-WIWI-102801	<a href="#">Management Accounting 2</a>	4,5 CR	Wouters

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 13 SPO) of the courses of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Competence Goal

Students

- are familiar with various management accounting methods,
- can apply these methods for cost estimation, profitability analysis, and product costing,
- are able to analyze short-term and long-decisions with these methods,
- have the capacity to devise instruments for organizational control.

### Content

The module consists of two courses "Management Accounting 1" and "Management Accounting 2". The emphasis is on structured learning of management accounting techniques.

### Annotation

The following courses are part of this module:

- The course Management Accounting 1, which is offered in every sommer semester
- The course Management Accounting 2, which is offered in every winter semester

### Workload

Total workload for 9 credit points: approx. 270 hours

The exact distribution is based on the credit points of the courses in the module.

## M

## 7.44 Module: Management and Marketing [M-WIWI-105768]

**Responsible:** Prof. Dr. Martin Klarmann  
 Prof. Dr. Hagen Lindstädt  
 Prof. Dr. Petra Nieken  
 Prof. Dr. Orestis Terzidis

**Organisation:** KIT Department of Economics and Management

**Part of:** [Business Administration \(mandatory\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each winter term	1 term	German	3	2

Mandatory			
T-WIWI-111594	<a href="#">Management and Marketing</a>	5 CR	Klarmann, Lindstädt, Nieken, Terzidis

**Competence Certificate**

The module examination is in written form on the two courses "Management" and "Marketing". The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

**Competence Goal**

The student

- has basic knowledge of central issues in business administration,
- has an understanding of problems, interrelationships and solutions in strategic management,
- is able to analyze and evaluate central areas of activity, functions and decisions in a company operating in a market economy,
- has an overview of important marketing-relevant questions and well-founded approaches to their solution.

With the knowledge acquired in the three basic business administration modules, the prerequisites are created in the area of business administration to expand this knowledge in the specialization program.

**Content**

An understanding of the basic functions of managing businesses is provided. In addition, the basics of marketing are taught.

**Workload**

Total workload required for 5 credit points: approx. 150 hours

## M

## 7.45 Module: Manufacturing Technology [M-MACH-101276]

**Responsible:** Prof. Dr.-Ing. Volker Schulze  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each winter term	1 term	German	3	6

Mandatory			
T-MACH-102105	Manufacturing Technology	9 CR	Schulze

**Competence Certificate**

Written Exam (180 min)

**Prerequisites**

None

**Competence Goal**

The students

- can name different manufacturing processes, can describe their specific characteristics and are capable to depict the general function of manufacturing processes and are able to assign manufacturing processes to the specific main groups.
- are enabled to identify correlations between different processes and to select a process depending on possible applications.
- are capable to describe the theoretical basics for the manufacturing processes they got to know within the scope of the course and are able to compare the processes.
- are able to correlate based on their knowledge in materials science the processing parameters with the resulting material properties by taking into account the microstructural effects.
- are qualified to evaluate different processes on a material scientific basis.

**Content**

Within this engineering sciences-oriented module the students will get to learn principle aspects of manufacturing technology. Further information can be found at the description of the lecture "Manufacturing Technology".

**Annotation**

The lecture Manufacturing Technology will be offered for the last time in WS 2024/2025 (the lecture videos will remain online). The exam will be offered for the last time in SS 2025 for first-time writers and for the last time in WS 2025/2026 for repeaters.

**Workload**

regular attendance: 63 hours

self-study: 207 hours

**Learning type**

Lectures, exercise, excursion

## M

## 7.46 Module: Materials Science [M-MACH-101260]

**Responsible:** Dr.-Ing. Susanne Wagner

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Engineering Sciences \(mandatory\)](#)

**Credits**  
3

**Grading scale**  
Grade to a tenth

**Recurrence**  
Each winter term

**Duration**  
1 term

**Level**  
3

**Version**  
1

Mandatory			
T-MACH-102078	<a href="#">Materials Science I</a>	3 CR	Wagner

### Competence Certificate

The assessment of the module is carried out by a written examination (150 min) about the lecture *Material Science I* [2125760] (according to Section 4(2), 1 of the examination regulation).

The examination is offered every semester. Re-examinations are offered at every ordinary examination date. The examination at the end of the summer term is carried out by a written or oral exam.

The grade of the module corresponds to the grade of this examination.

### Prerequisites

None.

### Competence Goal

Students are able to specify the basics of materials science and engineering and can apply it to simple problems in various technical areas.

As major part of the module, the students know the correlation between atomic structure and bonding of solids and the macroscopic properties such as mechanical behavior or electrical conductivity. They have basic knowledge with respect to materials characterization. The students are able to analyze phase diagrams with up to two components and can derive simple correlations among composition, processing, microstructure evolution and materials properties.

### Content

After an introduction to the atomic structure and interatomic bonding, elementary concepts of crystallography are given. Different types of crystal structures are explained and various types of imperfections in solids. Then, the mechanical behaviour and the physical properties of various types of materials (metals, polymers, ceramics) are discussed. The thermodynamic principles of solidification and the basic types of phase diagrams are given to understand to iron-carbon phase diagram and the manifold microstructures of steel and cast iron.

### Workload

The total workload for this module is approximately 90 hours.

## M

## 7.47 Module: Mathematics 1 [M-MATH-105754]

**Responsible:** Prof. Dr. Günter Last  
**Organisation:** KIT Department of Mathematics  
**Part of:** [Mathematics](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
10	Grade to a tenth	Each winter term	1 term	German	3	1

Mandatory			
T-MATH-111492	<a href="#">Mathematics I - Midterm Exam</a>	5 CR	Hug, Last, Nestmann, Winter
T-MATH-111493	<a href="#">Mathematics I - Final Exam</a>	5 CR	Hug, Last, Nestmann, Winter

**Competence Certificate**

The assessment consists of two written exams of 90 min each (in accordance with §4(2), 1 of the examination regulations). The first (midterm) exam takes place after half of the course, the second (final) exam takes place shortly after the end of the lectures. Auxiliary means such as literature or calculators are not allowed.

Resit exams for both exams are offered in the first weeks of the subsequent semester. Both resit exams will take place on the same day.

Candidates who have not passed the corresponding midterm or final exam, as well as those who have not yet taken a first attempt, will be eligible for the resit exams.

Oral re-examinations (in accordance with §9(1) of the examination regulations) for the midterm or final exam take place as individual examinations.

Both the midterm and final exams must be passed individually.

**Prerequisites**

none

**Competence Goal**

Students

- are confident with basic terms and definitions of mathematical language (propositions, sets, number systems, mappings, etc.),
- have a basic knowledge of differentiable calculus for functions of a single variable,
- know basic concepts of matrix theory,
- have a basic knowledge of integral calculus in a single variable.

**Content**

The course Mathematics 1 is the first part of the three semester basic training in higher mathematics. Topics are

- Propositional logic and basic set theory,
- Combinatorics and principles of counting,
- Number systems and basic arithmetics,
- Convergence of sequences and series,
- Continuous functions,
- Differentiable functions,
- Power series and special functions,
- Taylor's theorem,
- Riemann integral,
- n-dimensional vector spaces,
- Systems of linear equations,
- Scalar product, length and angle,
- Linear mappings and matrices,

**Module grade calculation**

The examination mark for Mathematics 1 is the average of the marks obtained in the midterm exam and final exam.



**Workload**

Work load: 300 hours (10 ETCS)

Classes: 150 hours

Preparation of courses and examinations: 150 hours

**Recommendation**

There are no prerequisites. It is strongly recommended to attend the three maths courses in the order Mathematics 1, Mathematics 2, Mathematics 3.

**Literature**

There are no Prerequisites. We strongly recommend to attend the three maths courses in the order Mathematics 1, Mathematics 2, Mathematics 3.

## M

## 7.48 Module: Mathematics 2 [M-MATH-105756]

**Responsible:** Prof. Dr. Günter Last  
**Organisation:** KIT Department of Mathematics  
**Part of:** [Mathematics](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
7	Grade to a tenth	Each summer term	1 term	German	3	1

Mandatory			
T-MATH-111495	<a href="#">Mathematics II - Midterm Exam</a>	3,5 CR	Hug, Last, Nestmann, Winter
T-MATH-111496	<a href="#">Mathematics II - Final Exam</a>	3,5 CR	Hug, Last, Nestmann, Winter

**Competence Certificate**

The assessment consists of two written exams of 75 min each (in accordance with §4(2), 1 of the examination regulations). The first exam (**midterm exam**) takes place after half of the course, the second exam (**final exam**) takes place shortly after the end of the lectures. Auxiliary means such as literature or calculators are not allowed.

Resit exams for both exams are offered in the first weeks of the subsequent semester. Both resit exams will take place on the same day.

Eligible for the resit exams are all candidates who either have not passed the corresponding midterm or final exam, or have not yet taken a first attempt.

Oral re-examinations (in accordance with §9(1) of the examination regulations) for the midterm or final exam take place as individual examinations.

Both the midterm and final exam must be passed individually.

**Competence Goal**

Students

- have a basic knowledge of determinants and eigenvalue theory,
- have a basic knowledge of multivariate differential calculus,
- have a basic knowledge of integrals of functions in several variables

**Content**

The course Mathematics 2 is the second part of the three semester basic training in higher mathematics. Topics are

- determinants,
- eigenvalue theory,
- multivariate calculus,
- multiple integrals,
- normed vector spaces and Banach's fixed point theorem.

**Module grade calculation**

The examination mark for Mathematics 2 is the average of the marks obtained in the midterm exam and final exam.

**Workload**

Work load: 210 hours (7 ETCS)

Classes: 120 hours

Preparation of courses and examinations: 90 hours

**Recommendation**

There are no prerequisites. It is strongly recommended to attend the three maths courses in the order Mathematics 1, Mathematics 2, Mathematics 3.

## M

## 7.49 Module: Mathematics 3 [M-MATH-105757]

**Responsible:** Prof. Dr. Günter Last  
**Organisation:** KIT Department of Mathematics  
**Part of:** [Mathematics](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each winter term	1 term	German	3	1

Mandatory			
T-MATH-111498	<a href="#">Mathematics III - Final Exam</a>	4 CR	Hug, Last, Nestmann, Winter

**Competence Certificate**

The assessment consists of a written exam of 75 min (in accordance with §4(2), 1 of the examination regulations). The exam takes place shortly after the end of the lectures. Auxiliary means such as literature or calculators are allowed.

A resit exam is offered in the first weeks of the subsequent semester.

Candidates who have not passed the exam, as well as those who have not yet taken a first attempt, will be eligible for the resit exam.

Oral re-examinations (in accordance with §8(2) of the examination regulations) for the written exam take place as individual examinations.

**Competence Goal**

Students

- are confident with important concepts in the theory of normed vector spaces,
- have some basic knowledge of ordinary differential equations,
- have some basic knowledge of Fourier analysis.

**Content**

The course Mathematics 3 is the third part of the three semester basic training in higher mathematics. Topics are

- normed spaces and Banach's fixed point theorem (if not treated in Mathematics 2),
- ordinary differential equations,
- linear differential equations,
- Fourier analysis,
- integral transformations.

**Module grade calculation**

The module grade is the grade of the written exam.

**Workload**

Work load: 120 hours (4 ETCS)

Classes: 60 hours

Preparation of courses and examinations: 60 hours

**Recommendation**

There are no prerequisites. It is strongly recommended to attend the three maths courses in the order Mathematics 1, Mathematics 2, Mathematics 3.

## M

## 7.50 Module: Measurement, Control, and Manufacturing Measurement Technology [M-ETIT-106581]

**Responsible:** Prof. Dr.-Ing. Michael Heizmann  
Prof. Dr.-Ing. Sören Hohmann

**Organisation:** KIT Department of Electrical Engineering and Information Technology

**Part of:** [Engineering Sciences \(Specialisation Program Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Engineering Sciences\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each summer term	1 term	German	3	1

Mandatory			
T-ETIT-112852	<a href="#">Measurement and Control Technology</a>	6 CR	Heizmann, Hohmann
T-ETIT-106057	<a href="#">Manufacturing Measurement Technology</a>	3 CR	Heizmann

### Competence Certificate

#### MRT:

The success control takes place in the form of a written examination of 120 minutes.

#### FMT:

The success control takes place in the form of a written examination of 90 minutes. If there are less than 20 examinees, an oral examination of approx. 20 minutes can be taken as an alternative. The module grade is the grade of the written or oral examination.

### Prerequisites

none

### Competence Goal

#### MRT:

- Students have a sound knowledge of the theoretical fundamentals of measurement technology, including scaling of measured quantities, the SI system of units, model building for measurement systems, description and treatment of systematic and stochastic measurement deviations, obtaining and linearizing measurement characteristics and propagation of measurement uncertainties.
- Students master the procedure for the basic design of measurement systems, taking into account the above knowledge.
- Students are able to analyze tasks in measurement technology, synthesize possible solutions for measurement systems and assess the properties of the solution obtained.
- The aim is to teach the basics of control engineering, therefore students are able to recognize and work on basic control engineering problems. They know the relevant technical terms.
- Students are able to formally describe real processes and to derive requirements for control structures in the time and image domain for fixed value and sequential control systems.
- Students are able to analyze the dynamics of systems using graphical and algebraic methods.
- Students will be able to name controller design methods for single-loop, single-variable systems. They will be able to design perfect closed-loop and open-loop control systems.
- They can perform design steps using the Nyquist criterion and the Wurzelortz curve.
- Students can name structures for disturbance compensation, of multi-loop control loops and two degrees of freedom structures and perform design steps for them.
- Students can digitize closed-loop and open-loop controls designed in the image domain using fast sampling design.
- Students are familiar with computer-aided design procedures and can carry out substeps in them.

#### FMT:

- Students have sound knowledge of fundamentals, methods and procedures for measuring and testing in industrial manufacturing.
- Students are able to evaluate different measuring principles, methods and devices with regard to their prerequisites, characteristics, areas of application and results.

Students are able to analyze production measurement tasks, derive the resulting requirements for a suitable metrological implementation, find suitable metrological implementations and point out the resulting properties of the measurement result....

**Content****MRT:**

- Description of measured quantities
  - Metric quantities and their properties
  - SI system of units
- Structure of measuring systems
- Measurement deviations
  - Systematic and stochastic deviations
- Curve fitting
  - Interpolation
  - Approximation
- Characteristic curves and their errors
  - Linearization of characteristic curves
  - Treatment of disturbance variables
- Uncertainty propagation
  - Error propagation
  - Guide to the Expression of Uncertainty in Measurement (GUM)
- Basic concepts of control engineering
  - Control loops
  - Control structures
  - Embedding in automation structures
- Description of systems in time and image domain
  - State space representation
  - Derivation of an I/O representation
  - Signal flow diagrams and control loop elements
  - Realization of controllers (analog and digital)
- Analysis of control loops in time and image domain
  - Stationary accuracy
  - Stability
  - Dynamics (bandwidth)
  - Robustness
- Design of single loop control loops
  - Perfect control
  - Design with the Nyquist criterion
  - Root locus curve
  - Heuristics
- Design of extended control loop structures
  - disturbance compensation
  - Meshing
  - Two degrees of freedom structure

**FMT:**

Manufacturing metrology plays an essential role in ensuring efficient industrial manufacturing. To a certain extent, it represents the sensory organs for quality assurance and automation technology and encompasses all activities associated with measurement and testing.

Based on the methodological fundamentals, which are the subject of the compulsory lecture "Measurement Technology", the lecture teaches procedures and implementations for measurement and testing in industrial practice. The focus is on geometric properties; most of the concepts presented can also be applied to other properties. Sensor systems for the measurement of geometric properties are presented and discussed with their characteristic properties.

The contents include in detail:

- Fundamentals of FMT
  - Basic terms, definitions
  - Dimensional standards
  - Measurement uncertainties
- Measurement technology in operation and in the measuring room
  - Coordinate metrology
  - Form and position metrology
  - Surface and contour metrology
  - Comparators
  - Micro and nano metrology
  - Measuring rooms
- Production-oriented metrology
  - Measuring equipment and gauges
  - Measuring devices
  - Measuring in the machine
  - Visual inspection

- Statistical process control (SPC)
- Optical/non-contact measuring methods
  - Integratable optical sensors
  - Stand-alone optical measurement systems
  - Optical 2.5D coordinate measuring technology
  - Optical 3D coordinate metrology
  - Computed tomography
  - System integration and standardization
- Gauge management
  - Significance and correlations
  - Controlled inspection processes
- Inspection planning

**Module grade calculation**

The module grade is the average of both examination grades weighted by credit points.

**Workload****MRT:**

Total: approx. 180h, of which

1. Attendance time in lectures and exercises: 60h
2. Preparation and follow-up of the lectures and exercises: 60 hours
3. Exam preparation and presence in the same: 60h

**FMT:**

Total: approx. 90h, of which

1. attendance time in lectures: 23h
2. preparation of lectures: 23h
3. exam preparation and presence in the exam: 44h

**Recommendation****MRT:**

Knowledge of "Signale und Systeme" is helpful.

**FMT:**

Knowledge of stochastics and fundamentals of measurement techniques is helpful.

## M

## 7.51 Module: Mechanical Design A [M-MACH-106527]

**Responsible:** Prof. Dr.-Ing. Tobias Düser  
Prof. Dr.-Ing. Sven Matthiesen

**Organisation:** KIT Department of Electrical Engineering and Information Technology  
KIT Department of Mechanical Engineering

**Part of:** [Engineering Sciences \(Specialisation Program Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Engineering Sciences\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each winter term	1 term	German	3	3

Mandatory			
T-MACH-112984	<a href="#">Mechanical Design A</a>	7 CR	Matthiesen
T-MACH-112981	<a href="#">Mechanical Design A, Workshop</a>	2 CR	Matthiesen

**Competence Certificate**

See individual courses

**Prerequisites**

None

**Competence Goal**

In mechanical design, students acquire skills in analysis and synthesis using examples. These include both individual machine elements such as bearings or springs and more complicated systems such as gears or couplings. After completing the machine design theory, the students are able to apply the contents learned to other technical systems - even those not known from the lecture - by transferring the principles of action and basic functions learned from examples to other contexts. This enables students to independently analyze unknown technical systems and synthesize suitable systems for given problems.

**Content**

MDA

- Springs
- Technical Systems
- Bearings
- Sealings
- Component Joints
- Gears

**Module grade calculation**

The module grade ist the grade of the written exam.

**Annotation**

None

**Workload**

MKL A: Total workload: 270 h, thereof attendance 75 h, divided into lecture + exercise: 4 SWS -> 60 h as well as workshop: 1 SWS -> 15 h; self-study 195 h

**Recommendation**

None

**Learning type**

Lectures, exercises and semester-long workshops as well as project work

**Literature**

Grundlagen der Berechnung und Gestaltung von Maschinenelementen; Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X oder Volltextzugriff über Uni-Katalog der Universitätsbibliothek

Grundlagen von Maschinenelementen für Antriebsaufgaben; Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8

**Base for**  
None



## M

## 7.52 Module: Mechatronic Product Design [M-MACH-106236]

**Responsible:** Prof. Dr.-Ing. Sören Hohmann  
Prof. Dr.-Ing. Sven Matthiesen

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each winter term	1 term	German	3	1

Mandatory			
T-MACH-112647	<a href="#">Mechatronic Systems and Products (mach/etit/wiwi)</a>	4 CR	Hohmann, Matthiesen
T-MACH-112648	<a href="#">Workshop Mechatronic Systems and Products (mach/etit/wiwi)</a>	5 CR	Hohmann, Matthiesen

### Competence Certificate

Success is monitored within the framework of an written examination (60 minutes) and an alternative academic achievement

### Prerequisites

None

### Competence Goal

The students

- are able to describe the difficulties of interdisciplinary projects.
- are able to coordinate processes, structures, responsibilities and interfaces within a project
- know different solutions for mechanic/electric problems
- know the elements of the treated product development processes, are able to describe different views onto them and execute them
- know the model based systems engineering approaches
- know the basic principles of virtual design and are able to apply the methods of virtual system design
- are able to identify the differences between virtuality and reality
- are able to recognize the advantages of early validation
- Students are able to understand and apply model description with Bond graphs and generalized system elements
- Students are able to synthesize and analyze multi-domain models
- Students are able to apply parameter identification methods

### Content

The lecture provides the theoretic basics, which will be applied and enhanced in development project during the semester. The project will take part in small groups, where the students have to organize and distribute the tasks on their own. In the project work - the workshop Mechatronic Systems and Products - they work on a development task in teams. This involves various development phases, from the development of technical solution concepts to the development and validation of virtual prototypes and physical functional prototypes.

### Module grade calculation

The module grade is composed in equal parts of the grades of the module's sub-services.

### Annotation

All relevant content (scripts, exercise sheets, etc.) for the course can be obtained via the eLearning platform ILIAS. To participate in the course, please complete the survey "Anmeldung und Gruppeneinteilung" in ILIAS before the start of the semester.

### Workload

1. Time of presence lecture:  $17 * 1.5 \text{ h} = 25,5 \text{ h}$
  2. Prepare/follow-up lecture:  $17 * 1.5 \text{ h} = 25,5 \text{ h}$
  3. Time of presence exercise + workshop:  $4 * 1,5\text{h} + 12 * 7\text{h} = 90 \text{ h}$
  4. Prepare/follow-up exercise:  $4 * 1.5\text{h} = 6 \text{ h}$
  5. Exam preparation and time of presence: 33 h
- Total: 180 h = 6 LP

**Recommendation**

It is recommended not to take this module with other time-consuming workshops, such as MD, at the same time.

**Learning type**

Lecture, exercise and project work

**Literature**

Janschek, Klaus (2010): Systementwurf mechatronischer Systeme. Methoden - Modelle - Konzepte. Berlin, Heidelberg: Springer.

Weilkiens, Tim (2008): Systems engineering mit SysML/UML. Modellierung, Analyse, Design. 2., aktualisierte u. erw. Aufl. Heidelberg: Dpunkt-Verl.

## M

## 7.53 Module: Methodical Foundations of OR [M-WIWI-101414]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Operations Research (Specialisation Program Operations Research)  
 Compulsory Elective Modules (Operations Research)

Credits	Grading scale	Recurrence	Duration	Level	Version
9	Grade to a tenth	Each term	1 term	3	10

Compulsory Elective Courses (Election: at least 1 item as well as between 4,5 and 9 credits)			
T-WIWI-102726	Global Optimization I	4,5 CR	Stein
T-WIWI-103638	Global Optimization I and II	9 CR	Stein
T-WIWI-102724	Nonlinear Optimization I	4,5 CR	Stein
T-WIWI-103637	Nonlinear Optimization I and II	9 CR	Stein
Supplementary Courses (Election: )			
T-WIWI-106546	Introduction to Stochastic Optimization	4,5 CR	Rebennack
T-WIWI-102727	Global Optimization II	4,5 CR	Stein
T-WIWI-102725	Nonlinear Optimization II	4,5 CR	Stein
T-WIWI-102704	Facility Location and Strategic Supply Chain Management	4,5 CR	Nickel

### Competence Certificate

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

At least one of the courses *Nonlinear Optimization I* [2550111] and *Global Optimization I* [2550134] has to be examined.

### Competence Goal

The student

- names and describes basic notions for optimization methods, in particular from nonlinear and from global optimization,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions.

### Content

The modul focuses on theoretical foundations as well as solution algorithms for optimization problems with continuous decision variables. The lectures on nonlinear programming deal with local solution concepts, whereas the lectures on global optimization treat approaches for global solutions.

### Annotation

The planned lectures and courses for the next three years are announced online (<http://www.ior.kit.edu>).

### Workload

The total workload for this module is approx. 270 hours (9 credits). The allocation is based on the credit points of the courses in the module.

The total number of hours per course results from the time required to attend the lectures and exercises, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

### Recommendation

The courses Introduction to Operations Research I and II are helpful.

## M

## 7.54 Module: Microsystem Technology [M-MACH-101287]

**Responsible:** Prof. Dr. Jan Gerrit Korvink  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	4	5

Mikrosystemtechnik (Election: at least 9 credits)			
T-MACH-100967	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II	3 CR	Guber
T-MACH-100968	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III	3 CR	Guber
T-MACH-105182	Introduction to Microsystem Technology I	3 CR	Badilita, Jouda, Korvink
T-MACH-105183	Introduction to Microsystem Technology II	3 CR	Jouda, Korvink
T-MACH-108312	Introduction to Microsystem Technology - Practical Course	4 CR	Last
T-MACH-101910	Microactuators	3 CR	Kohl
T-MACH-102152	Novel Actuators and Sensors	4 CR	Kohl, Sommer
T-ETIT-101907	Optoelectronic Components	4 CR	Randel
T-MACH-100530	Physics for Engineers	6 CR	Dienwiebel, Gumbsch, Nesterov-Müller, Weygand
T-MACH-102164	Practical Training in Basics of Microsystem Technology	3 CR	Last
T-MACH-111807	Introduction to Bionics	3 CR	Hölscher

**Competence Certificate**

The assessment is carried out as partial exams

(according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Prerequisites**

none

**Competence Goal**

construction and production of e. g. mechanical, optical, fluidic and sensory microsystems.

**Content**

The module offers courses in microsystem technology. Knowledge is imparted in various fields like basics in construction and production of e. g. mechanical, optical, fluidic and sensory microsystems.

**Workload**

270 hours

## M

## 7.55 Module: Mobile Machines [M-MACH-101267]

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Level	Version
9	Grade to a tenth	Each winter term	2 terms	4	5

Mandatory			
T-MACH-105168	Mobile Machines	8 CR	Geimer
Mobile Machines (Election: at least 1 credit)			
T-MACH-105307	Drive Train of Mobile Machines	4 CR	Geimer
T-MACH-105311	Design and Development of Mobile Machines	4 CR	Geimer
T-MACH-108887	Design and Development of Mobile Machines - Advance	0 CR	Geimer, Siebert
T-MACH-102093	Fluid Power Systems	5 CR	Geimer
T-MACH-111389	Fundamentals in the Development of Commercial Vehicles	3 CR	Weber
T-MACH-105172	Simulation of Coupled Systems	4 CR	Geimer
T-MACH-108888	Simulation of Coupled Systems - Advance	0 CR	Geimer
T-MACH-111821	Control of Mobile Machines	4 CR	Becker, Geimer
T-MACH-111820	Control of Mobile Machines – Prerequisites	0 CR	Becker, Geimer

### Competence Certificate

The assessment is carried out as a general oral exam (duration approx. 60 mins) (according to Section 4(2), 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The examination is offered every semester. Re-examinations are offered at every ordinary examination date.

The overall grade of the module is the grade of the oral examination.

The assessment may be carried out as partial oral exams (according to Section 4(2), 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. In this case the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

The assessment procedures are described for each course of the module separately.

### Prerequisites

Successful passing of the corresponding modules of the basic program.

### Competence Goal

The student

- knows and understands the basic structure of the machines
- masters the basic skills to develop the selected machines

### Content

In the module of *Mobile Machines* [WI4INGMB15] the students will learn the structure of the machines and deepen the knowledge of the subject for developing the machines. After conclusion the module the student will know the latest developments in mobile machines and is able to evaluate the concepts and the trends of developments. The module is practically orientated and supported by industry partners.

### Workload

The total workload for this module is approximately 270 hours. For further information see German version.

### Recommendation

Knowledge of Fluid Power Systems are helpful, otherwise it is recommended to take the course *Fluid Power Systems* [2114093].

## M

## 7.56 Module: Mobility and Infrastructure [M-BGU-101067]

**Responsible:** Prof. Dr.-Ing. Peter Vortisch

**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences

**Part of:** [Engineering Sciences \(Specialisation Program Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Engineering Sciences\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each summer term	1 term	German	3	2

Mandatory			
T-BGU-101791	<a href="#">Mobility and Infrastructure</a>	9 CR	Vortisch

**Prerequisites**

none

**Annotation**

none

**Recommendation**

For students from the KIT-Department of Economics and Management it is recommended to take part in the excercises.

## M

## 7.57 Module: Module Bachelor's Thesis [M-WIWI-101601]

**Responsible:** Studiendekan des KIT-Studienganges  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Bachelor's Thesis

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
12	Grade to a tenth	Each term	1 term	German	3	6

Mandatory			
T-WIWI-103067	Bachelor's Thesis	12 CR	Studiendekan des KIT-Studienganges

### Competence Certificate

The Bachelor's thesis is a written piece of work that demonstrates that the student is capable of dealing with a problem from their subject in an academic manner. It is regulated in detail in 14 SPO 2015.

The thesis is supervised and assessed by at least two KIT examiners. At least one of the examiners must be a professor and usually an examiner at the KIT Department of Economics and Management

The regular processing time is 6 months. Upon justified request by the student, the examination board can extend the processing time by a maximum of one month. If the Bachelor's thesis is not completed and submitted to the examiner by the deadline, it will be graded as "insufficient" unless the student is not responsible for this failure (e.g. maternity leave).

The Examination Board determines the languages in which the Bachelor's thesis can be written. At the student's request, the examiner may authorize the Bachelor's thesis to be written in a language other than German. The topic can only be returned once and only within the first month of the completion period. A new topic must be submitted and issued within four weeks.

If the thesis is not passed, it may be repeated once. A new topic must be issued. The same topic may not be repeated. This also applies to comparable topics. In case of doubt, the examination board will decide. The new topic may again be supervised by the examiners of the first thesis.

This regulation also applies analogously after an official withdrawal from a registered topic.

The module grade is the grade for the Bachelor's thesis.

### Prerequisites

Prerequisites for admission to the Bachelor Thesis: minimum of 120 credits must be earned. All module examinations of the basic program must be passed.

At the request of the student, the examination committee decides on exceptions to these regulations.

It is recommended to begin the Bachelor Thesis in the 5th or 6th Semester.

A written confirmation of the examiner about supervising the Bachelor's Thesis is required.

Please pay regard to the institute specific rules for supervising a Bachelor Thesis.

The Bachelor Thesis has to contain the following declaration in German:

*„Ich versichere wahrheitsgemäß, die Arbeit selbstständig verfasst, alle benutzten Hilfsmittel vollständig und genau angegeben und alles kenntlich gemacht zu haben, was aus Arbeiten anderer unverändert oder mit Abänderungen entnommen wurde sowie die Satzung des KIT zur Sicherung guter wissenschaftlicher Praxis in der jeweils gültigen Fassung beachtet zu haben.“*

If this declaration is not given, the Bachelor Thesis will not be accepted.

### Competence Goal

The student can independently work on a relevant topic in accordance with scientific criteria within the specified time frame.

He/she is in a position to research, analyze the information, abstract and identify basic principles and regulations from less structured information.

He/she reviews the task ahead, can select scientific methods and techniques and apply them to solve a problem or identify further potential. This is basically also done under consideration of social and/or ethical aspects.

He/she can interpret, evaluate and if required, graphically present the obtained results.

He/she is in a position to clearly structure a research paper and communicate in writing using the technical terminology.

### Content

The Bachelor Thesis is the first major scientific work. The topic of the Bachelor Thesis will be chosen by the student themselves and adjusted with the examiner. The topic has to be related to Industrial Engineering and Management and has to refer to subject-specific or interdisciplinary problems.

**Workload**

The preparation and presentation of the Bachelor's thesis is expected to take a total of approx. 360 hours. In addition to writing the thesis, this figure includes all necessary activities such as literature research, familiarization with the topic, familiarization with any necessary tools, conducting studies/experiments, supervision meetings, etc.



## M

## 7.58 Module: Optimization under Uncertainty [M-WIWI-103278]

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Operations Research (Specialisation Program Operations Research)  
 Compulsory Elective Modules (Operations Research)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	4

Compulsory Elective Courses (Election: between 1 and 2 items)			
T-WIWI-106546	Introduction to Stochastic Optimization	4,5 CR	Rebennack
T-WIWI-106545	Optimization under Uncertainty	4,5 CR	Rebennack
Supplementary Courses (Election: at most 1 item)			
T-WIWI-102724	Nonlinear Optimization I	4,5 CR	Stein
T-WIWI-102714	Tactical and Operational Supply Chain Management	4,5 CR	Nickel

**Competence Certificate**

The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Prerequisites**

At least one of the courses *Introduction to Stochastic Optimization* and *Optimization approaches under uncertainty* has to be taken.

**Competence Goal**

The student

- denominates and describes basic notions for optimization methods under uncertainty, in particular from stochastic optimization,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems under uncertainty and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions, in particular of
- stochastic optimization problems.

**Content**

The module focuses on modeling and analyzing mathematical optimization problems where certain data is not fully present at the time of decision-making. The lectures on the introduction to stochastic optimization deal with methods to integrate distribution information into the mathematical model. The lectures on the optimization approaches under uncertainty offer alternative approaches such as robust optimization.

**Annotation**

The curriculum, planned for three years in advance, can be found on the Internet at <http://sop.ior.kit.edu/28.php>.

**Workload**

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

**Recommendation**

Knowledge from the lectures "Introduction to Operations Research I" and "Introduction to Operations Research II" are helpful.

**M****7.59 Module: Preliminary Exam [M-WIWI-100950]****Organisation:** University**Part of:** Preliminary Exam

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
0	pass/fail	Each term	2 terms	German	3	1

Mandatory			
T-WIWI-102708	<a href="#">Economics I: Microeconomics</a>	5 CR	Puppe, Reiß
T-WIWI-102737	<a href="#">Statistics I</a>	5 CR	Grothe, Schienle

**Modelled deadline**This module must be passed until the end of the **3. term**.**Prerequisites**

none

## M

## 7.60 Module: Product Lifecycle Management [M-MACH-101270]

**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German	4	7

Product Lifecycle Management (Kernbereich) (Election: 1 item)			
T-MACH-105147	<a href="#">Product Lifecycle Management</a>	4 CR	Ovtcharova
Product Lifecycle Management (Election: at least 5 credits)			
T-MACH-102187	<a href="#">CAD-NX Training Course</a>	2 CR	Ovtcharova
T-MACH-111283	<a href="#">Development Methods of Technical Systems</a>	4 CR	Maier, Ovtcharova
T-MACH-102209	<a href="#">Information Engineering</a>	3 CR	Meyer, Ovtcharova
T-MACH-106457	<a href="#">I4.0 Systems Platform</a>	4 CR	Maier, Ovtcharova
T-MACH-102153	<a href="#">PLM-CAD Workshop</a>	4 CR	Ovtcharova
T-MACH-102155	<a href="#">Product, Process and Resource Integration in the Automotive Industry</a>	4 CR	Mbang
T-MACH-102083	<a href="#">Integrated Information Systems for Engineers</a>	4 CR	Ovtcharova
T-MACH-102149	<a href="#">Virtual Reality Practical Course</a>	4 CR	Ovtcharova
T-MACH-113670	<a href="#">Practical course in robot programming with Python</a>	4 CR	Rönnau

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

None

### Competence Goal

The students should:

- have basic knowledge about the challenges in product and process data management regarding the whole product lifecycle;
- have understanding about challenges and functional concepts of product lifecycle management;
- be able to rudimental operate common PLM/CAX/VR - systems,
- develop and present prototype solutions in teams of different domains.

### Content

Product Lifecycle Management (PLM), Generation and management of information, Architecture and functionality of information systems, Industry 4.0, CAX and VR-systems.

### Workload

270 hours

### Learning type

Lectures, Tutorials

## M

## 7.61 Module: Production Engineering [M-MACH-106590]

**Responsible:** Prof. Dr.-Ing. Volker Schulze  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German	3	3

Production Engineering (Election: at least 9 credits)			
T-MACH-113647	Digitalization from Product Concept to Production	4 CR	Wawerla
T-MACH-113832	Global Production	5 CR	Lanza
T-MACH-105188	Integrative Strategies in Production and Development of High Performance Cars	4 CR	Schlichtenmayer
T-MACH-112115	Artificial Intelligence in Production	5 CR	Fleischer
T-MACH-105783	Learning Factory "Global Production"	6 CR	Lanza
T-MACH-108878	Laboratory Production Metrology	5 CR	Lanza, Stamer
T-MACH-110318	Product- and Production-Concepts for Modern Automobiles	4 CR	Kienzle, Steegmüller
T-MACH-110984	Production Technology for E-Mobility	4 CR	Fleischer
T-MACH-110960	Project Internship Additive Manufacturing: Development and Production of an Additive Component	4 CR	Zanger
T-MACH-102107	Quality Management	4 CR	Lanza
T-MACH-113031	Rapid Industrialization of Immature Products using the Example of Electric Mobility	4 CR	Bauer
T-MACH-112121	Seminar Application of Artificial Intelligence in Production	4 CR	Fleischer
T-MACH-105185	Control Technology	4 CR	Gönnheimer
T-MACH-113372	Strategic Decision-Making in Global Production Network Design: A Seminar on Optimization and Simulation	4 CR	Benfer, Lanza
T-MACH-105177	Metal Forming	4 CR	Herlan
T-MACH-102148	Gear Cutting Technology	4 CR	Klaiber

**Competence Certificate**

Oral exams: duration approx. 5 min per credit point

Written exams: duration approx. 20 - 25 min per credit point

Amount, type and scope of the success control can vary according to the individually choice.

**Prerequisites**

The module M-MACH-101284 -Production Technology must not have been started.

**Competence Goal**

The students

- are able to apply the methods of production science to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques for a specific problem.
- are able to use their knowledge target-oriented to achieve an efficient production technology.
- are able to analyze new situations and choose methods of production science target-oriented based on the analyses, as well as justifying their selection.
- are able to describe and compare complex production processes exemplarily.

**Content**

Within this module the students will get to know and learn about production science. Manifold lectures and excursions as part of several lectures provide specific insights into the field of production science.

**Workload**

The work load is about 270 hours, corresponding to 9 credit points.

**Learning type**

Lectures, seminars, workshops, excursions

## M

## 7.62 Module: Production, Logistics and Information Systems [M-WIWI-105770]

**Responsible:** Prof. Dr. Wolf Fichtner  
 Prof. Dr. Andreas Geyer-Schulz  
 Prof. Dr. Alexander Mädche  
 Prof. Dr. Stefan Nickel  
 Prof. Dr. Frank Schultmann  
 Prof. Dr. Christof Weinhardt

**Organisation:** KIT Department of Economics and Management

**Part of:** [Business Administration \(mandatory\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each winter term	1 term	German	3	2

Mandatory			
T-WIWI-111602	<a href="#">Production, Logistics and Information Systems</a>	5 CR	Fichtner, Geyer-Schulz, Mädche, Nickel, Schultmann, Weinhardt

### Competence Certificate

The module examination is in written form. The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

### Competence Goal

The student

- has basic knowledge of the interaction of information technologies, people and organizational structures,
- is familiar with the structures of information systems,
- masters the essential concepts, theories and methods of production management,
- has an understanding of problems, interrelationships and solutions of logistics processes of enterprises.

With the knowledge acquired in the three basic modules BWL, the prerequisites are created in the area of BWL to expand this knowledge in the specialization program.

### Content

The basics of business informatics are taught. In addition, the area of production management and logistics is introduced.

### Workload

Total workload required for 5 credit points: approx. 150 hours

## M

## 7.63 Module: Public and Civil Law [M-INFO-105084]

**Responsible:** N.N.  
**Organisation:** KIT Department of Informatics  
**Part of:** [Compulsory Elective Modules \(Law or Sociology\)](#)

Credits	Grading scale	Recurrence	Duration	Level	Version
9	Grade to a tenth	Each term	2 terms	3	2

Mandatory			
T-INFO-103339	<a href="#">Civil Law for Beginners</a>	5 CR	Matz
T-INFO-110300	<a href="#">Public Law I &amp; II</a>	6 CR	N.N.

**Competence Certificate**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations take place in every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Prerequisites**

None

**Workload**

See German version.

## M

## 7.64 Module: Public Finance [M-WIWI-101403]

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	7

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102877	<a href="#">Introduction to Public Finance</a>	4,5 CR	Wigger
T-WIWI-108711	<a href="#">Basics of German Company Tax Law and Tax Planning</a>	4,5 CR	Gutekunst, Wigger
T-WIWI-102739	<a href="#">Public Revenues</a>	4,5 CR	Wigger

**Competence Certificate**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Competence Goal**

The student

- has advanced knowledge of the theory and policy of taxation and public debt.
- understand the scope, structure and forms of government borrowing.
- is familiar with the structure of German and international tax law
- is able to interpret and motivate fiscal policy issues.

**Content**

As a branch of Economics, Public Finance is concerned with the theory and policy of the public sector and its interrelations with the private sector. It analyzes the economic role of the state from a normative as well as from a positive point of view. The normative view examines efficiency- and equity-oriented motives for government intervention and develops fiscal policy guidelines. The positive view explains the actual behavior of economic agents in public sector affairs. Special fields of Public Finance are public revenues, i.e. taxes and public debt, public expenditures for publicly provided goods, and welfare programs.

**Annotation**

The course T-WIWI-102790 "Specific Aspects in Taxation" will no longer be offered in the module as of winter semester 2018/2019.

**Workload**

Total workload for 9 credit points: approx. 270 hours

The exact distribution is based on the credit points of the courses in the module.

**Recommendation**

It is recommended to attend the course 2560129 after having completed the course 2560120.



## M

## 7.65 Module: Rail System Technology [M-MACH-101274]

**Responsible:** Prof. Dr.-Ing. Martin Cichon  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	4	5

Mandatory			
T-MACH-102143	Rail System Technology	9 CR	Cichon

**Competence Certificate**

written examination in German language

Duration: 120 minutes

No tools or reference materials may be used during the exam except calculator and dictionary

**Competence Goal**

- The students understand relations and interdependencies between rail vehicles, infrastructure and operation in a rail system.
- Based on operating requirements and legal framework they derive the requirements concerning a capable infrastructure and suitable concepts of rail vehicles.
- They recognize the impact of alignment, understand the important function of the wheel-rail-contact and estimate the impact of driving dynamics on the operating program.
- They evaluate the impact of operating concepts on safety and capacity of a rail system.
- They know the infrastructure to provide power supply to rail vehicles with different drive systems.
- The students learn the role of rail vehicles and understand their classification. They understand the basic structure und know the functions of the main systems. They understand the overall tasks of vehicle system technology.
- They learn functions and requirements of car bodies and judge advantages and disadvantages of design principles. They know the functions of the car body's interfaces.
- They know about the basics of running dynamics and bogies.
- The students learn about advantages and disadvantages of different types of traction drives and judge, which one fits best for each application.
- They understand brakes from a vehicular and an operational point of view. They assess the fitness of different brake systems.
- They know the basic setup of train control management system and understand the most important functions.
- They specify and define suitable vehicle concepts based on requirements for modern rail vehicles.

**Content**

1. Railway System: railway as system, subsystems and interdependencies, definitions, laws, rules, railway and environment, economic impact
2. Operation: Transportation, public transport, regional transport, long-distance transport, freight service, scheduling
3. Infrastructure: rail facilities, track alignment, railway stations, clearance diagram
4. Wheel-rail-contact: carrying of vehicle mass, adhesion, wheel guidance, current return
5. Vehicle dynamics: tractive and brake effort, driving resistance, inertial force, load cycles
6. Signaling and Control: operating procedure, succession of trains, European Train Control System, blocking period, automatic train control
7. Traction power supply: power supply of rail vehicles, comparison electric traction and diesel traction, dc and ac networks, system pantograph and contact wire, filling stations
8. Vehicle system technology: structure and main systems of rail vehicles
9. Car body: functions, requirements, design principles, crash elements, coupling, doors and windows
10. Bogies: forces, running gears, bogies, Jakobs-bogies, active components, connection to car body, wheel arrangement
11. Drives: principles, electric drives (main components, asynchronous traction motor, inverter, with DC supply, with AC supply, without line supply, multisystem vehicles, dual mode vehicles, hybrid vehicles), non-electric drives
12. Brakes: basics, principles (wheel brakes, rail brakes, blending), brake control (requirements and operation modes, pneumatic brake, electropneumatic brake, emergency brake, parking brake)
13. Train control management system: definition of TCMS, bus systems, components, network architectures, examples, future trends
14. Vehicle concepts: trams, metros, regional trains, intercity trains, high speed trains, double deck vehicles, locomotives, freight wagons

**Annotation**

A bibliography is available for download (Ilias-platform).

The lectures can be attended in the same term.

**Workload**

1. Regular attendance: 42 hours
2. Self-study: 42 hours
3. Exam and preparation: 186 hours

**Learning type**

Lectures

## M

## 7.66 Module: Seminar Module [M-WIWI-101816]

**Responsible:** Studiendekan des KIT-Studienganges  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Compulsory Elective Modules \(mandatory\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
3	Grade to a tenth	Each term	1 term	German	3	6

Compulsory Elective Courses (Election: 3 credits)			
T-WIWI-103486	<a href="#">Seminar in Business Administration (Bachelor)</a>	3 CR	Professorenschaft des Fachbereichs Betriebswirtschaftslehre
T-WIWI-103485	<a href="#">Seminar in Informatics (Bachelor)</a>	3 CR	Professorenschaft des Instituts AIFB
T-WIWI-108763	<a href="#">Seminar in Engineering Science Master (approval)</a>	3 CR	Fachvertreter ingenieurwissenschaftlicher Fakultäten
T-MATH-102265	<a href="#">Seminar in Mathematics (Bachelor)</a>	3 CR	Last, Nestmann, Winter
T-WIWI-103488	<a href="#">Seminar in Operations Research (Bachelor)</a>	3 CR	Nickel, Rebennack, Stein
T-INFO-101997	<a href="#">Seminar: Legal Studies I</a>	3 CR	N.N.
T-WIWI-103489	<a href="#">Seminar in Statistics (Bachelor)</a>	3 CR	Grothe, Schienle
T-WIWI-103487	<a href="#">Seminar in Economics (Bachelor)</a>	3 CR	Professorenschaft des Fachbereichs Volkswirtschaftslehre
T-MACH-102135	<a href="#">Conveying Technology and Logistics</a>	3 CR	Furmans, Pagani
T-MACH-109062	<a href="#">Seminar Production Technology</a>	3 CR	Fleischer, Lanza, Schulze
T-MACH-108737	<a href="#">Seminar Data-Mining in Production</a>	3 CR	Lanza

**Competence Certificate**

**SPO 2015:** The modul examination consists of **one** seminar (according to §4 (3), 3 of the examintaion regulation). A detailed description of the assessment is given in the specific course characerization.

**SPO 2007:**The modul examination consists of **two** seminars and of at least one **key qualification (KQ)** course (according to §4 (3), 3 of the examintaion regulation). As key qualification one of the following courses must be chosen: Academic Learning HoC (2-3 credits), Key Qualifikations ZAK (1-3 credits), Elective „Educational development for student teachers“ (2-3 credits) or language courses SpZ. A detailed description of every singled assessment is given in the specific course characerization.

**Prerequisites**

All modules of the basic program should be completed. For further information see German version.

**Competence Goal**

- Students are able to independently deal with a defined problem in a specialized field based on scientific criteria.
- They are able to research, analyze the information, abstract and derive basic principles and regularities from unstructured information.
- They can solve the problems in a structured manner using their interdisciplinary know-how.
- They know how to validate the obtained results.
- Finally, they are able to logically and systematically present the results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.
- Students are familiar with the DFG´s Code of Conduct "Guidelines for Safeguarding Good Research Practice" and base their scientific work on it.

**Content**

Competences which are gained in the seminar module especially prepare the student for composing the final thesis. Within the term paper and the presentation the student exercises himself in scientific working techniques supported by the supervisor.

Beside advancing skills in techniques of scientific working there are gained integrative key qualifications as well. A detailed description of these qualifications is given in the section "Key Qualifications" of the module handbook.

Furthermore, the module also includes additional key qualifications provided by the KQ-courses.

**Annotation**

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

**Workload**

See German version.

## M

## 7.67 Module: Signals and Systems [M-ETIT-106372]

**Responsible:** Dr.-Ing. Mathias Kluwe  
Prof. Dr.-Ing. Sander Wahls

**Organisation:** KIT Department of Electrical Engineering and Information Technology

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each winter term	2 terms	German	3	2

Mandatory			
T-ETIT-112860	Signals and Systems	7 CR	Kluwe, Wahls
T-ETIT-112861	Signals and Systems - Workshop	2 CR	Wahls

### Competence Certificate

The assessment of success takes place in the form of a written examination lasting 180 minutes. In addition, the completion of the written work in the workshop is a prerequisite for passing the module.

### Prerequisites

none

### Competence Goal

- Students are familiar with the elementary properties of signals and systems in the time domain and can analyze existing signals and systems with regard to these properties.
- They are familiar with the Fourier, Laplace and Z transforms with their definitions and calculation rules and can apply these to given signals and systems.
- Students are able to describe given signals and systems using the resulting transforms and analyze their respective properties in the frequency domain.
- They determine e.g. continuous-time low-pass filters that fulfill given specifications.
- They are able to design anti-aliasing and interpolation filters for A/D and D/A conversion.
- Students are able to realize given continuous-time systems digitally.

**Content**

- Introduction, complex numbers, continuous-time signals, signal space  $L^\infty$
- Signal spaces  $L^1$  and  $L^2$  (Lebesgue integral, Hilbert space)
- Continuous-time systems in the time domain (linearity, time invariance, stability, convolution representation)
- Fourier series
- Fourier transform I (derivation & existence, pairs)
- Fourier transform II (properties, description of time-continuous systems)
- Meaning of phase (group delay, all-pass, minimum phase)
- Low-pass filter (Butterworth, Chebyshev)
- Uncertainty principle (mean time/frequency/duration/bandwidth)
- Complex analysis I (basics of complex functions, differentiation, holomorphic functions, Cauchy Riemann differential equations, curve integrals)
- Complex Analysis II (Cauchy integral theorem, Laurent expansions, isolated singularities, meromorphic functions, residue theorem)
- Hilbert transform (Bedrosian/envelope, Kramers-Kronig, phase gain)
- Two-sided Laplace transform and systems with rational transfer function
- Bode plots
- Discrete-time signals and spaces, sampling theorem, interpolation filters, aliasing
- Discrete Fourier series and transformation
- Z-transform and discrete-time systems
- Discrete-time processing of continuous-time signals (anti-aliasing filters with oversampling and undersampling)
- One-sided Laplace transform (def. incl. some properties and calculation rules) c
- Solution of ordinary differential equations, back transformation via partial fraction decomposition
- Alternatives of the Laplace inverse transform (convolution, complex inverse formula)
- One-sided z-transformation
- Solving difference equations with the z-transform

**Module grade calculation**

The module grade is the grade of the written exam.

**Workload**

Total approx. 240h, of which

Attendance time in lectures and exercises: 75h

Preparation/follow-up of the lectures and exercises: 130h

3. Exam preparation and presence in the same: 40h

Preparation time for the workshop: 5h

Presence time in the workshop: 15h

Preparation of the protocol for the workshop: 5h

Total: 270 LP = 9 LP

## M

## 7.68 Module: Sociology/Empirical Social Research [M-GEISTSOZ-101167]

**Responsible:** Prof. Dr. Gerd Nollmann  
**Organisation:** KIT Department of Humanities and Social Sciences  
**Part of:** [Compulsory Elective Modules \(Law or Sociology\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each winter term	2 terms	German	3	2

Mandatory			
T-GEISTSOZ-109047	<a href="#">Analysis of Social Structures (WiWi)</a>	3 CR	Nollmann
T-GEISTSOZ-109048	<a href="#">Social Science A (WiWi)</a>	3 CR	Nollmann
T-GEISTSOZ-109049	<a href="#">Social Science B (WiWi)</a>	3 CR	Nollmann

**Competence Goal**

The student

- Gains theoretical and methodical knowledge of social processes and structures
- Is able to apply acquired knowledge practically
- Is able to present work results in a precise and clear way

**Content**

This module offers students the possibility to get to know research problems and to answer these theoretically as well as empirically. For example: Who does earn how much in his job and why? How do subcultures emerge? Why are boys' grades in school always worse than those of girls? Do divorces have negative influences on the development of children? How does mass consumption influence the individual? Is there a world society emerging? In addition, this module contains courses on sociological methods that are essential to answer such questions scientifically.

The lecture on social structure analysis gives an overview of large social structures such as the education system, labour market, institutions, demography, etc. for Germany and in international comparison. The content of the social research seminars is determined individually by the lecturers. Students are free to choose one seminar each for Social Research A/B.

## M

## 7.69 Module: Statistics and Econometrics [M-WIWI-101599]

**Responsible:** Prof. Dr. Oliver Grothe  
Prof. Dr. Melanie Schienle

**Organisation:** KIT Department of Economics and Management

**Part of:** Economics (Specialisation Program Economics)  
Compulsory Elective Modules (Economics)  
Compulsory Elective Modules (Statistics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	6

Mandatory			
T-WIWI-102736	Economics III: Introduction in Econometrics	5 CR	Schienle
Supplementary Courses (Election: between 1 and 2 items)			
T-WIWI-103063	Analysis of Multivariate Data	4,5 CR	Grothe
T-WIWI-103064	Financial Econometrics	4,5 CR	Schienle
T-WIWI-110939	Financial Econometrics II	4,5 CR	Schienle
T-WIWI-112153	Microeconometrics	4,5 CR	Krüger
T-WIWI-103065	Statistical Modeling of Generalized Regression Models	4,5 CR	Heller

**Competence Certificate**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Prerequisites**

The course "Economics III: Introduction in Econometrics" is compulsory and must be examined. In case the course „Economics III: Introduction in Econometrics“ has already been examined within the module „Applied Microeconomics“, the course „Economics III: Introduction in Econometrics“ is not compulsory.

**Competence Goal**

The student

- shows an advanced understanding of Econometric techniques and statistical model building.
- is able to develop Econometric models for applied problems based on available data
- is able to apply techniques and models with statistical software, to interpret results and to judge on different approaches with appropriate statistical criteria.

**Content**

The courses provide a solid Econometric and statistical foundation of techniques necessary to conduct valid regression, time series and multivariate analysis.

**Workload**

The total workload for this module is approximately 270 hours.



## M

## 7.70 Module: Statistics and Econometrics II [M-WIWI-105414]

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)  
[Compulsory Elective Modules \(Statistics\)](#)

<b>Credits</b> 9	<b>Grading scale</b> Grade to a tenth	<b>Recurrence</b> Each term	<b>Duration</b> 1 term	<b>Language</b> German	<b>Level</b> 3	<b>Version</b> 5
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Compulsory Elective Courses (Election:)			
T-WIWI-103063	<a href="#">Analysis of Multivariate Data</a>	4,5 CR	Grothe
T-WIWI-103064	<a href="#">Financial Econometrics</a>	4,5 CR	Schienle
T-WIWI-110939	<a href="#">Financial Econometrics II</a>	4,5 CR	Schienle
T-WIWI-112153	<a href="#">Microeconometrics</a>	4,5 CR	Krüger
T-WIWI-103065	<a href="#">Statistical Modeling of Generalized Regression Models</a>	4,5 CR	Heller

**Competence Certificate**

The assessment is carried out as partial exams of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Prerequisites**

The following module must have been started: Statistics and Econometrics [M-WIWI-101599].

**Competence Goal**

The student

- shows an advanced understanding of Econometric techniques and statistical model building.
- is able to develop advanced Econometric models for applied problems based on available data
- is able to apply techniques and models efficiently with statistical software, to interpret results and to judge on different approaches with appropriate statistical criteria.

**Content**

The courses provide foundations of advanced Econometric and statistical techniques for regression, time series and multivariate analysis.

**Workload**

The total workload for this module is approximately 270 hours.

## M

## 7.71 Module: Strategy and Organization [M-WIWI-101425]

**Responsible:** Prof. Dr. Hagen Lindstädt

**Organisation:** KIT Department of Economics and Management

**Part of:** Business Administration (Specialisation Program Business Administration)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German	3	6

Strategy and Organization (Election: at least 9 credits)			
T-WIWI-102630	Managing Organizations	3,5 CR	Lindstädt
T-WIWI-102871	Problem Solving, Communication and Leadership	2 CR	Lindstädt
T-WIWI-113090	Strategic Management	3,5 CR	Lindstädt

### Competence Certificate

Erfolgreicher Abschluss aller fachlich entsprechenden Module aus dem Grundlagenprogramm.

### Competence Goal

- The student can prepare strategic decisions along the ideal-typical strategy process and classify them strategically.
- He/she evaluates the strengths and weaknesses of existing organizational structures and regulations using systematic criteria and can review the management of organizational change.
- The student can effectively carry out decision-making by structuring problems and communicating solutions, taking into account the situation and the personalities involved.
- Through intensive exposure to a variety of practice-relevant case studies, students learn to apply and discuss theoretical course content to real-life situations.

### Content

The module has a practical and action-oriented structure. Students become familiar with central frameworks of strategic management along the ideal-typical strategy process. An overview of fundamental models will be given, and an action-oriented integration performance will be achieved through the transfer of theory to practical issues. In addition, students learn concepts for the design of organizational structures, regulation of organizational processes as well as control of organizational changes. This enables a well-founded assessment of existing organizational structures and regulations. Furthermore, participants are enabled to recognize, structure, analyze and effectively communicate problems. In addition, central leadership concepts are taught that address the influence of the situation, the leadership personality and the characteristics of those being led.

### Workload

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

## M

## 7.72 Module: Supply Chain Management [M-WIWI-101421]

**Responsible:** Prof. Dr. Stefan Nickel

**Organisation:** KIT Department of Economics and Management

**Part of:** [Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	11

Mandatory			
T-WIWI-107506	<a href="#">Platform Economy</a>	4,5 CR	Weinhardt
Supplementary Courses (Election: 1 item)			
T-WIWI-102704	<a href="#">Facility Location and Strategic Supply Chain Management</a>	4,5 CR	Nickel
T-WIWI-102714	<a href="#">Tactical and Operational Supply Chain Management</a>	4,5 CR	Nickel

### Competence Certificate

This module is only available in the elective field. In the specialization program Business Administration, the election is not permitted.

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

The course T-WIWI-107506 "Platform Economy" has to be taken.

### Competence Goal

The students

- are able to understand and evaluate the control of cross-company supply chains based on a strategic and operative view,
- are able to analyse the coordination problems within the supply chains,
- are able to identify and integrate adequate information system infrastructures to support the supply chains,
- are able to apply theoretical methods from the operations research and the information management,
- learn to elaborate solutions in a team

### Content

The module "Supply Chain Management" gives an overview of the mutual dependencies of information systems and of supply chains spanning several enterprises. The specifics of supply chains and their information needs set new requirements for the operational information management. In the core lecture "Platform Economy" the focus is set on markets between two parties that act through an intermediary on an Internet platform. Topics discussed are network effects, peer-to-peer markets, blockchains and market design. The course is held in English and teaches parts of the syllabus with the support of a case study in which students analyze a platform.

The module is completed by an elective course addressing appropriate optimization methods for the Supply Chain Management and for modern logistic approaches.

### Annotation

The planned lectures in the next terms can be found on the websites of the respective institutes IISM, IFL and IOR.

### Workload

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

## M

## 7.73 Module: Team Project Management and Technology [M-WIWI-105440]

**Responsible:** Prof. Dr. Martin Klarmann  
Prof. Dr. Alexander Mädche

**Organisation:** KIT Department of Economics and Management

**Part of:** [Compulsory Elective Modules \(Team Project\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	1

Mandatory			
T-WIWI-110968	<a href="#">Team Project Management and Technology</a>	9 CR	Klarmann, Mädche

**Competence Certificate**

Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The module [M-WIWI-105447 - Team Project Management and Technology \(BUS/ENG\)](#) must not have been started.

**Competence Goal**

After successful completion of the team project, the students can:

- select and apply the methods, techniques and tools required for problem solving
- systematically analyze a given problem in an interdisciplinary team and develop and evaluate an artifact-centered solution
- constructively solve challenges and conflicts that arise in teamwork.

**Content**

The team project "Management and Technology" aims to prepare students for working in heterogeneously composed teams.

A team of 4-5 students will work on defined interdisciplinary questions at the interface of economics and MINT subjects. The result of the projects should typically not only be a presentation or a report, but an artifact, e.g. a method, an algorithm, a model, a software or a component.

The team projects already implement the concept of research-oriented teaching in the Bachelor's degree and aim to build up problem-solving competence in the students.

**Workload**

The total of 270 working hours (9 credit points) per team member (4-5 members per team) are divided into the following tasks:

- communication:
  - Team meetings: 30 h (2h per week, 15 weeks),
  - Electronic exchange: 20 h,
  - Final presentation: 10
- Documentation and development:
  - Analysis and design: 70 h,
  - Development: 90 h,
  - Tests and quality assurance: 50 h

## M

**7.74 Module: Team Project Management and Technology (BUS/ENG) [M-WIWI-105447]****Organisation:** KIT Department of Economics and Management**Part of:** [Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	1

Mandatory			
T-WIWI-110977	<a href="#">Team Project Management and Technology (BUS/ENG)</a>	9 CR	Klarmann, Mädche

**Competence Certificate**

Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The module [M-WIWI-105440 - Team Project Management and Technology](#) must not have been started.

**Competence Goal**

After successful completion of the team project, the students can:

- select and apply the methods, techniques and tools required for problem solving
- systematically analyze a given problem in an interdisciplinary team and develop and evaluate an artifact-centered solution
- constructively solve challenges and conflicts that arise in teamwork.

**Content**

The team project "Management and Technology" is carried out by a business administration or engineering institute. It aims to prepare students for working in heterogeneously composed teams.

A team of 4-5 students will work on defined interdisciplinary questions at the interface of economics and MINT subjects. The result of the projects should typically not only be a presentation or a report, but an artifact, e.g. a method, an algorithm, a model, a software or a component.

The team projects already implement the concept of research-oriented teaching in the Bachelor's degree and aim to build up problem-solving competence in the students.

**Workload**

The total of 270 working hours (9 credit points) per team member (4-5 members per team) are divided into the following tasks:

- communication:
  - Team meetings: 30 h (2h per week, 15 weeks),
  - Electronic exchange: 20 h,
  - Final presentation: 10
- Documentation and development:
  - Analysis and design: 70 h,
  - Development: 90 h,
  - Tests and quality assurance: 50 h

## M

## 7.75 Module: Technical Logistics [M-MACH-101279]

**Responsible:** Prof. Dr.-Ing. Kai Furmans

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each winter term	1 term	German	3	4

Mandatory			
T-MACH-109919	Basics of Technical Logistics I	4 CR	Mittwollen, Oellerich
T-MACH-109920	Basics of Technical Logistics II	6 CR	Furmans

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the requirement of credits of this module. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

T-MACH-109920 "Basics of Technical Logistics II" is based on T-MACH-109919 "Basics of Technical Logistics I". The contents are taught one after the other in one course in the winter semester. The individual exams are taken on one day at the end of the semester.

### Prerequisites

none

### Competence Goal

The student

- acquires well-founded knowledge on the main topics of technical logistics
- gets an overview of different applications of technical logistics in practice,
- acquires expertise and understanding about functionality of material handling systems.

### Content

The module *Technical Logistics* provides in-depth basics on the main topics of technical logistics. The module focuses on technical characteristics of material handling technology. To gain a deeper understanding, the course is accompanied by exercises.

### Workload

270 hours

### Learning type

Lecture

## M

## 7.76 Module: Topics in Finance I [M-WIWI-101465]

**Responsible:** Prof. Dr. Martin Ruckes  
Prof. Dr. Marliese Uhrig-Homburg

**Organisation:** KIT Department of Economics and Management

**Part of:** Business Administration (Specialisation Program Business Administration)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	10

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-107505	Financial Accounting for Global Firms	4,5 CR	Luedecke
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-112694	FinTech	4,5 CR	Thimme
T-WIWI-102626	Business Strategies of Banks	3 CR	Müller
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Prerequisites

It is only possible to choose this module in combination with the module *Essentials in Finance*. The module is passed only after the final partial exam of *Essentials in Finance* is additionally passed.

In addition to that it is possible to choose the module *Topics in Finance II*.

### Competence Goal

The student

- has advanced skills in modern finance
- is able to apply these skills in practice in the fields of finance and accounting, financial markets and banking

### Content

The module *Topics in Finance I* is based on the module *Essentials of Finance*. The courses deal with advanced issues concerning the fields of finance and accounting, financial markets and banking from a theoretical and practical point of view.

### Annotation

The course T-WIWI-102790 "Specific Aspects in Taxation" will no longer be offered in the module as of winter semester 2018/2019.

### Workload

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

## M

## 7.77 Module: Topics in Finance II [M-WIWI-101423]

**Responsible:** Prof. Dr. Martin Ruckes  
Prof. Dr. Marliese Uhrig-Homburg

**Organisation:** KIT Department of Economics and Management

**Part of:** Business Administration (Specialisation Program Business Administration)  
Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
Compulsory Elective Modules (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	10

**Election notes**

+++++

This module will not count towards the degree until the module *Essentials in Finance* has also been successfully completed. The *Essentials in Finance* module may not be booked out as an additional examination.

+++++

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-107505	Financial Accounting for Global Firms	4,5 CR	Luedecke
T-WIWI-112694	FinTech	4,5 CR	Thimme
T-WIWI-102626	Business Strategies of Banks	3 CR	Müller
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg

**Competence Certificate**

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Prerequisites**

It is only possible to choose this module in combination with the module *Essentials in Finance*. The module is passed only after the final partial exam of *Essentials in Finance* is additionally passed.

In addition to that it is possible to choose the module *Topics in Finance I*.

**Competence Goal**

The student

- has advanced skills in modern finance
- is able to apply these skills in practice in the fields of finance and accounting, financial markets and banking

**Content**

The module *Topics in Finance II* is based on the module *Essentials of Finance*. The courses deal with advanced issues concerning the fields of finance and accounting, financial markets and banking from a theoretical and practical point of view.

**Annotation**

The course T-WIWI-102790 "Special Taxation" will no longer be offered in the module as of winter semester 2018/2019.

**Workload**

The total workload for this module is approximately 270 hours.



## M

## 7.78 Module: Vehicle Development [M-MACH-101265]

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)  
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)  
 Compulsory Elective Modules (Engineering Sciences)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	4	8

Vehicle Development (Election: at least 9 credits)			
T-MACH-102207	Tires and Wheel Development for Passenger Cars	3 CR	Leister
T-MACH-111389	Fundamentals in the Development of Commercial Vehicles	3 CR	Weber
T-MACH-105162	Fundamentals of Automobile Development I	1,5 CR	Harrer
T-MACH-105163	Fundamentals of Automobile Development II	1,5 CR	Harrer
T-MACH-102156	Project Workshop: Automotive Engineering	4,5 CR	Frey, Gauterin, Gießler
T-MACH-110796	Python Algorithm for Vehicle Technology	4 CR	Rhode
T-MACH-105172	Simulation of Coupled Systems	4 CR	Geimer
T-MACH-108888	Simulation of Coupled Systems - Advance <i>This item will not influence the grade calculation of this parent.</i>	0 CR	Geimer
T-MACH-102148	Gear Cutting Technology	4 CR	Klaiber
T-MACH-112126	Data-Driven Algorithms in Vehicle Technology	4 CR	Scheubner

### Competence Certificate

The assessment is carried out as partial exams.

The partial exams consists of a written exam (90 to 120 minutes) or an oral exam (duration 30 to 40 minutes).

### Prerequisites

None

### Competence Goal

The student

- knows and understands the procedures in automobile development,
- knows and understands the technical specifications at the development procedures,
- is aware of notable boundaries like legislation.

### Content

By taking the module Vehicle Development the students get to know the methods and processes applied in the automobile industry. They learn the technical particularities which have to be considered during the vehicle development and it is shown how the numerous single components cooperate in a harmoniously balanced complete vehicle. There is also paid attention on special boundary conditions like legal requirements.

### Workload

The total work load for this module is about 270 Hours (9 Credits). The partition of the work load is carried out according to the credit points of the courses of the module. The work load for courses with 6 credit points is about 180 hours, for courses with 4.5 credit points about 135 hours, for courses with 3 credit points about 90 hours, and for courses with 1.5 credit points about 45 hours. The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam duration and the time that is required to achieve the objectives of the module as an average student with an average performance.

### Recommendation

Knowledge of the content of the courses *Engineering Mechanics I* [2161238], *Engineering Mechanics II* [2162276] and *Basics of Automotive Engineering I* [2113805], *Basics of Automotive Engineering II* [2114835] is helpful.

### Learning type

The teaching and learning procedures (lecture, lab course, workshop) are described for each course of the module separately.

## 8 Courses

T

### 8.1 Course: Advanced Lab Blockchain Hackathon (Bachelor) [T-WIWI-111127]

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	1

Exams			
ST 2024	7900096	<a href="#">Advanced Lab Blockchain Hackathon (Bachelor)</a>	Sunyaev

#### Competence Certificate

The alternative exam assessment consists of:

- a practical work
- a presentation and
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

#### Prerequisites









None





## T

## 8.2 Course: Advanced Lab Informatics (Bachelor) [T-WIWI-110541]

**Responsible:** Professorenschaft des Instituts AIFB  
**Organisation:** KIT Department of Economics and Management  
**Part of:** M-WIWI-101426 - Electives in Informatics

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	1

Events					
ST 2024	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / 	Schiefer, Schüler, Toussaint
ST 2024	2512400	Advanced Lab Development of Sociotechnical Information Systems (Bachelor)	3 SWS	Practical course / 	Sunyaev, Leiser
ST 2024	2512402	Advanced Lab Blockchain Hackathon (Bachelor)		Practical course / 	Sunyaev, Sturm, Kannengießer, Beyene
ST 2024	2512554	Practical lab Security, Usability and Society (Bachelor)	3 SWS	Practical course / 	Volkamer, Strufe, Mayer, Berens, Mossano, Hennig, Veit, Länge
WT 24/25	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / 	Toussaint, Schiefer, Schüler
WT 24/25	2512400	Practical Course Sociotechnical Information Systems Development (Bachelor)	3 SWS	Practical course / 	Sunyaev, Goram, Leiser
WT 24/25	2512554	Praktikum Security, Usability and Society (Bachelor)	3 SWS	Practical course / 	Volkamer, Strufe, Berens, Länge, Mossano, Hennig, Hilt, Veit
WT 24/25	2512555	Praktikum Security, Usability and Society (Master)	3 SWS	Practical course / 	Volkamer, Strufe, Berens, Länge, Mossano, Hennig, Hilt, Veit
Exams					
ST 2024	7900016	Advanced Lab Development of Sociotechnical Information Systems (Bachelor)			Sunyaev
ST 2024	7900029	Practical lab Security, Usability and Society (Bachelor)			Volkamer
ST 2024	7900085	Advanced Lab Realization of innovative services (Bachelor)			Oberweis
ST 2024	7900096	Advanced Lab Blockchain Hackathon (Bachelor)			Sunyaev
WT 24/25	7900047	Advanced Lab Realization of Innovative Services (Bachelor)			Oberweis
WT 24/25	7900080	Advanced Lab Development of Sociotechnical Information Systems (Bachelor)			Sunyaev
WT 24/25	7900116	Advanced Lab Security, Usability and Society (Bachelor)			Volkamer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

The alternative exam assessment consists of:

- a practical work
- a presentation and
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

### Prerequisites

None

**Annotation**

The title of this course is a generic one. Specific titles and the topics of offered seminars will be announced before the start of a semester in the internet at <https://portal.wiwi.kit.edu>.

Below you will find excerpts from events related to this course:

**Lab Realisation of innovative services (Bachelor)**

2512204, SS 2024, 3 SWS, Language: German, [Open in study portal](#)

**Practical course (P)  
On-Site**

**Content**

As part of the lab, the participants should work together in small groups to realize innovative services (mainly for students).

**Organizational issues**

Informationen zu Themen und die Anmeldung erfolgt vor Praktikumsbeginn im Wiwi-Portal

<https://portal.wiwi.kit.edu/ys>

**Advanced Lab Development of Sociotechnical Information Systems (Bachelor)**

2512400, SS 2024, 3 SWS, Language: German/English, [Open in study portal](#)

**Practical course (P)  
Blended (On-Site/Online)**

**Content**

The aim of the lab is to get to know the development of socio-technical information systems in different application areas. In the event framework, you should develop a suitable solution strategy for your problem alone or in group work, collect requirements, and implement a software artifact based on it (for example, web platform, mobile apps, desktop application). Another focus of the lab is on the subsequent quality assurance and documentation of the implemented software artifact.

Registration information will be announced on the course page.

**Practical lab Security, Usability and Society (Bachelor)**

2512554, SS 2024, 3 SWS, Language: German/English, [Open in study portal](#)

**Practical course (P)  
Online**

## Content

The Praktikum Security, Usability and Society will cover topics both of usable security and privacy programming, and how to conduct user studies. To reserve a place, please, register on the WiWi portal and send an email with your chosen topic, plus a back-up one, to [mattia.mossano@kit.edu](mailto:mattia.mossano@kit.edu). Topics are assigned first-come-first-served until all of them are filled. Topics in italics have already been assigned.

Application deadline 12.04.2024

Assignment 15.04.2024

Confirmation deadline 19.04.2024

## Important dates:

Kick-off: 17.04.2024, 09:00 AM CET in Big Blue Button - [Link](#)

Report & code feedback deadline: 26.07.2024, 23:59 CET

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Presentation draft deadline: 06.09.2024, 23:59 CET

Feedback on presentation draft: 13.09.2024, 23:59 CET

Final presentation deadline: 17.09.2024, 23:59 CET

Presentation day: 18.09.2024, 09:00 CET

Topics:

### Privacy Friendly Apps

In this area, students complete an app (or an extension of an app) among our Privacy-Friendly Apps. Please click the following link to know more about them: <https://secuso.aifb.kit.edu/english/105.php>. Students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: NoPhish App

Number of students: 2 Ba/Ma

Description: The NoPhish app was one of the first measures from the NoPhish concept. The app has been around for a long time and has not been updated since then. Accordingly, the task of the project is to make the app functional for the current Android version. The app is also to be optimised so that updates, e.g. new chapters, can be added easily.

### Programming Usable Security Intervention

In this subject, students develop a part of coding, an extension, or another programming task dealing with various usable security interventions, e.g. as an extension like TORPEDO ( <https://secuso.aifb.kit.edu/english/TORPEDO.php> ) or PassSec + ( <https://secuso.aifb.kit.edu/english/PassSecPlus.php> ). Just as before, students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: Hacking TORPEDO

Number of students: 1-2 Ba/Ma

Description: TORPEDO has existed for many years both as a Thunderbird add-on and as a web extension. TORPEDO is intended to help address various forms of phishing attacks and thereby protect the user, e.g. against various manipulations of the domain or additional tooltips. However, no targeted attacks on TORPEDO have yet been found. The aim of the work is to subject TORPEDO to a stress test and also to develop attacks that specifically target the implementation of TORPEDO.

### Run Usable Security Studies and Results Analysis

These topics are related to run and analyse the results of user-studies. Online studies, interviews and lab studies are all possible, depending on the topic. At the end of the semester, the students present a report / paper with the analyses conducted and a talk in which they present the results.

Title: Visualization of Eye Gaze Patterns during Authentication Tasks

Number of students: 1 Ba/Ma

Description: In this project, students will analyze and visualize eye gaze data collected during two specific authentication tasks: the Dot Task and the Slider Task. The primary objective is to represent subjects' eye movements visually, enhancing the understanding of gaze patterns during the authentication process. *\*Dot Task Visualization:\** For the Dot Task, participants were instructed to focus on a sequence of dots displayed on a screen. The dataset includes the positions of these dots and the corresponding gaze locations of the subjects. The student's task is to create a dynamic visualization that not only represents these positions accurately but also illustrates the sequence in which the dots were focused on by the subjects. *\*Slider Task Visualization:\** The Slider Task involved presenting participants with a series of images, for which both the images' locations on the screen and the subjects' gaze locations are recorded. The challenge is to develop a heatmap visualization based on this data, effectively demonstrating the concentration and dispersion of gaze points across different images.

Title: Compare BSI Phishing Game with the NoPhish Game

Number of students: 1 Ba

Description: The NoPhish app, one of the first implementations of the NoPhish concept, is a form of serious game. The BSI has also developed a game in the field of phishing. Both "games" use different approaches to impart knowledge from the same context. The aim is to evaluate the two games in terms of similarities and differences.

Title: Phishing Advice from Organizations (English Only)

Number of students: 1 Ba

Description: Many companies distribute information on how to recognise phishing via various channels such as e-mails, e.g. Amazon or Telekom. The question arises as to how helpful these tips are in reality. Are they too specific to the context of the company or so abstractly formulated that they are of no real help to users? The aim of the work is to collect various hints and then compare them with the hints of the NoPhish concept in order to find differences and similarities between the hints and the concept.

Title: Chatbots for Literature Reviews

Number of students: 1 Ba

Description: Chatbots are becoming increasingly popular and are already being used in various areas. But in what form can these bots be used for science? The variety of chatbots also raises the question of whether there are chatbots that are better suited to a scientific context. The aim is to identify a selection of chatbots and evaluate them in terms of their effectiveness for future literature research. To this end, the results of the chatbots will be compared with the ACM database in order to check their effectiveness for finding literature for a specific period of time.

Title: Phishing through homographic attacks in messengers and social networks

Number of students: 1-2 Ba/Ma

Description: The task will be to test three types of attacks in messengers and social networks that work in some email clients. First is the link mismatch attack, where the link text differs from the actual link target. Second is an attack in which the actual link target is disguised by URL encoding [[https://en.wikipedia.org/wiki/URL\\_encoding](https://en.wikipedia.org/wiki/URL_encoding)], and finally homographic attacks which uses Internationalized Domain Names [[https://en.wikipedia.org/wiki/IDN\\_homograph\\_attack](https://en.wikipedia.org/wiki/IDN_homograph_attack)], in which Latin characters are replaced by characters of a different alphabet in the domain name. The attacks are predefined, so no knowledge of phishing techniques is required.

Title: Usability Study of Mobile Authentication for Elderly Users with Rheumatoid Arthritis (English only)

Number of students: 1 Ba/Ma

Description: Authentication is an ever important topic, especially in the mobile context. However, it becomes even more relevant when considering accessibility to it. Nowadays, a common authentication method is using a PIN. Yet, given the low hand mobility of users affected by rheumatoid arthritis, sometimes using PINs can be difficult. In this topic, the student will conduct several sessions of an already designed lab study with various participants using arthritis simulation gloves to evaluate three PIN-pad interfaces aimed at making authentication more accessible. The study will also investigate the preferences of users regarding PIN-pad interfaces through drawings and proposals of changes. The student will then analyse the results through inferential statistics. Depending on the quality of the outcome, the results will then be published in a paper and the student will be added to the authors list.

This event counts towards the KASTEL certificate. Further information on how to obtain the certificate can be found on the SECUSO website ([https://secuso.aifb.kit.edu/Studium\\_und\\_Lehre.php](https://secuso.aifb.kit.edu/Studium_und_Lehre.php)).



### Lab Realisation of innovative services (Bachelor)

2512204, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)

Practical course (P)  
Blended (On-Site/Online)

#### Content

As part of the lab, the participants should work together in small groups to realize innovative services (mainly for students).

#### Organizational issues

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### Praktikum Security, Usability and Society (Bachelor)

2512554, WS 24/25, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)  
Blended (On-Site/Online)

## Content

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### There are two rounds to apply:

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Feedback on presentation draft: 19.03.2024, 23:59 CET

Final presentation deadline: 22.03.2024, 23:59 CET

Presentation day: 29.03.2024, 09:00 CET

Topics:

### Privacy Friendly apps

In this subject, students complete an app (or an extension of an app) among our Privacy-Friendly Apps. Please click the following link to know more about them: <https://secuso.aifb.kit.edu/english/105.php>. Students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: *Notes 2.0*

Number of students: 1 Bachelor

Description: Update und Vorbereitung zur Veröffentlichung der Notes 2.0-App.

### Designing Security User studies

These topics are related to how to set up and conduct user studies of various types. Online studies, interviews and lab studies are possible. At the end of the semester, the students present a report / paper and a talk in which they present their methodologies and the results of small pre-studies.

Title: Designing User Studies for Evaluating Biometric Authentication Systems

Number of students: 1 Bachelor or Master level

Description: The proposed topic focuses on designing and implementing a user study methodology to evaluate the usability and user perception of biometric authentication systems. Biometric authentication involves using unique physiological or behavioral characteristics, such as fingerprints, facial recognition, or voice patterns, to verify a user's identity. The goal of this research is to understand the factors that affect the effectiveness and acceptance of biometric authentication and provide insights for designing user-friendly and secure biometric authentication systems.

Title: How useful are security advice given by ChatGPT?

Number of students: 1-2 Bachelor level

Description: ChatGPT is nowadays used for multiple reasons. One of them is to obtain advice on security decision, asking the program how to be best defend oneself. However, what are these advice based on? And more importantly, is the quality of the advice in line with the best practices or are they misleading? The goal of this topic is to design an expert study where various advice given by ChatGPT on security topics (e.g., password policies, phishing, etc.) are compared against the advice of experts. The results then need to be analysed and classified to determine the quality of ChatGPT advice.

### Run Usable Security Studies and Results Analysis

These topics are related to run and analyse the results of user-studies. Online studies, interviews and lab studies are all possible, depending on the topic. At the end of the semester, the students present a report / paper with the analyses conducted and a talk in which they present the results.

Title: Phishing through homographic attacks in messengers and social networks

Number of students: 1-2 Bachelor or Master level

Description: The task will be to test three types of attacks in messengers and social networks that work in some email clients. First is the link mismatch attack, where the link text differs from the actual link target. Second is an attack in which the actual link target is disguised by URL encoding [[https://en.wikipedia.org/wiki/URL\\_encoding](https://en.wikipedia.org/wiki/URL_encoding)], and finally homographic attacks which uses Internationalized Domain Names [[https://en.wikipedia.org/wiki/IDN\\_homograph\\_attack](https://en.wikipedia.org/wiki/IDN_homograph_attack)], in which Latin characters are replaced by characters of a different alphabet in the domain name. The attacks are predefined, so no knowledge of phishing techniques is required.

Title: Usability Study of Mobile Authentication for Elderly Users with Rheumatoid Arthritis (English only)

Number of students: 1 Bachelor or Master level

Description: Authentication is an ever important topic, especially in the mobile context. However, it becomes even more relevant when considering accessibility to it. Nowadays, a common authentication method is using a PIN. Yet, given the low hand mobility of users affected by rheumatoid arthritis, sometimes using PINs can be difficult. In this topic, the student will conduct several sessions of an already designed lab study with various participants using arthritis simulation gloves to evaluate three PIN-pad interfaces aimed at making authentication more accessible. The study will also investigate the preferences of users regarding PIN-pad interfaces through drawings and proposals of changes. The student will then analyse the results through inferential statistics. Depending on the quality of the outcome, the results will then be published in a paper and the student will be added to the authors list.

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### Praktikum Security, Usability and Society (Master)

2512555, WS 24/25, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)  
Blended (On-Site/Online)



**Content**

The Praktikum Security, Usability and Society will cover topics both of usable security and privacy programming, and how to conduct user studies. To reserve a place, please, register on the WiWi portal and send an email with your chosen topic, plus a back-up one, to [mattia.mossano@kit.edu](mailto:mattia.mossano@kit.edu). Topics are assigned first-come-first-served until all of them are filled. Topics in italics have been already assigned.

**There are two deadlines:**

Summer round closes on 16.07.2023. Assignment will be done by 17.07.2023 and confirmation must be received by 21.07.2023.

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**Important dates:**

Kick-off: 05.10.2023, 09:00 AM CET in Big Blue Button - [Link](#)

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Feedback on presentation draft: 19.03.2024, 23:59 CET

Final presentation deadline: 22.03.2024, 23:59 CET

Presentation day: 29.03.2024, 09:00 CET

**Topics:****Programming Usable Security Intervention**

In this subject, students develop a part of coding, an extension, or another programming task dealing with various usable security interventions, eg as an extension. Eg TORPEDO ( <https://secuso.aifb.kit.edu/english/TORPEDO.php> ) or PassSec + ( <https://secuso.aifb.kit.edu/english/PassSecPlus.php> ). Just as before, students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: Making e-mails more visible by embedding moving images

Number of students: 1 Master

Description: In case of a security incident, it is necessary to inform the affected persons about their vulnerabilities as soon as possible. Within the context of the INSPECTION project, we are currently informing website owners via e-mail about security related vulnerabilities on their websites. Although e-mails have been shown to be the most cost-efficient means to deliver such information, they have not lead to an appropriate remediation rate. While speaking to the affected website owners we learned that they would appreciate more information, although not being delivered as more text in the e-mail. Also, we learned that most e-mails were not read because they were considered spam. Thus, we need to find a way to make e-mail notifications more effective in raising peoples' awareness. Videos have been proven effective to raise awareness in the context of IT security. The goal of the project will be, to explore ways to embed videos in an e-mail via HTML (either as gifs or as preview to a YouTube video). The challenge is to make this e-mail readable for different clients and webmail as well as getting it delivered through spam filters.

**Designing Security User studies**

These topics are related to how to set up and conduct user studies of various types. Online studies, interviews and lab studies are possible. At the end of the semester, the students present a report / paper and a talk in which they present their methodologies and the results of small pre-studies.

Title: Designing User Studies for Evaluating Biometric Authentication Systems

Number of students: 1 Bachelor or Master level

Description: The proposed topic focuses on designing and implementing a user study methodology to evaluate the usability and user perception of biometric authentication systems. Biometric authentication involves using unique physiological or behavioral characteristics, such as fingerprints, facial recognition, or voice patterns, to verify a user's identity. The goal of this research is to understand the factors that affect the effectiveness and acceptance of biometric authentication and provide insights for designing user-friendly and secure biometric authentication systems.

Title: Can anxiety influences security advices

Number of students: 1 Master level

Description: Nowadays ChatGPT is used for a multitude of reasons. One is to ask advice on security topics. However, previous research showed that oftentimes ChatGPT creates answers based on previous interactions with it. Therefore, is it possible that also security advice change according to the previous interaction? And if this is the case, can more anxious props lead to completely different results? The student will have to read the previous literature on ChatGPT, find expert advice on security topics and create an experiment to determine if anxiety influenced the advice given by ChatGPT.

Title: Investigating ChatGPT privacy tradeoffs and users perception of them (English only)

Number of students: 1 Master level

Description: As ChatGPT grows in popularity, it becomes increasingly vital to examine the privacy trade-offs associated with its usage. The user's willingness to accept these trade-offs is instrumental in understanding the wider implications of employing AI language models. This topic involves a two-part exploration into the privacy trade-offs of using ChatGPT. Initially, the student will analyse ChatGPT's Terms and Conditions and conduct a short literature review to identify potential privacy trade-offs. The found trade-offs need to be categorised into a set of trade-offs that will be investigated. Subsequently, the student will design an online user study, incorporating various question types and a deception study, to gauge the willingness of ChatGPT users to accept these trade-offs. Finally, the student will test the designed online user study in the course of small pre-test.

### Run Usable Security Studies and Results Analysis

These topics are related to run and analyse the results of user-studies. Online studies, interviews and lab studies are all possible, depending on the topic. At the end of the semester, the students present a report / paper with the analyses conducted and a talk in which they present the results.

Title: Phishing through homographic attacks in messengers and social networks

Number of students: 1-2 Bachelor or Master level

Description: The task will be to test three types of attacks in messengers and social networks that work in some email clients. First is the link mismatch attack, where the link text differs from the actual link target. Second is an attack in which the actual link target is disguised by URL encoding [[https://en.wikipedia.org/wiki/URL\\_encoding](https://en.wikipedia.org/wiki/URL_encoding)], and finally homographic attacks which uses Internationalized Domain Names [[https://en.wikipedia.org/wiki/IDN\\_homograph\\_attack](https://en.wikipedia.org/wiki/IDN_homograph_attack)], in which Latin characters are replaced by characters of a different alphabet in the domain name. The attacks are predefined, so no knowledge of phishing techniques is required.

Title: Usability Study of Mobile Authentication for Elderly Users with Rheumatoid Arthritis (English only)

Number of students: 1 Bachelor or Master level

Description: Authentication is an ever important topic, especially in the mobile context. However, it becomes even more relevant when considering accessibility to it. Nowadays, a common authentication method is using a PIN. Yet, given the low hand mobility of users affected by rheumatoid arthritis, sometimes using PINs can be difficult. In this topic, the student will conduct several sessions of an already designed lab study with various participants using arthritis simulation gloves to evaluate three PIN-pad interfaces aimed at making authentication more accessible. The study will also investigate the preferences of users regarding PIN-pad interfaces through drawings and proposals of changes. The student will then analyse the results through inferential statistics. Depending on the quality of the outcome, the results will then be published in a paper and the student will be added to the authors list.

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## T

## 8.3 Course: Advanced Lab Realization of Innovative Services (Bachelor) [T-WIWI-112915]

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	1

Events					
ST 2024	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course /	Schiefer, Schüler, Toussaint
WT 24/25	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course /	Toussaint, Schiefer, Schüler
Exams					
ST 2024	7900085	Advanced Lab Realization of innovative services (Bachelor)			Oberweis
WT 24/25	7900047	Advanced Lab Realization of Innovative Services (Bachelor)			Oberweis

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

The alternative exam assessment consists of:

- a practical work
- a presentation and
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

### Annotation

As part of the lab, the participants should work together in small groups to produce innovative services (mainly for students).

Further information can be found on the ILIAS page of the lab.

Below you will find excerpts from events related to this course:

## V

### Lab Realisation of innovative services (Bachelor)

2512204, SS 2024, 3 SWS, Language: German, [Open in study portal](#)

Practical course (P)  
On-Site

### Content

As part of the lab, the participants should work together in small groups to realize innovative services (mainly for students).

### Organizational issues

Informationen zu Themen und die Anmeldung erfolgt vor Praktikumsbeginn im Wiwi-Portal

<https://portal.wiwi.kit.edu/ys>

## V

### Lab Realisation of innovative services (Bachelor)

2512204, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)

Practical course (P)  
Blended (On-Site/Online)

### Content

As part of the lab, the participants should work together in small groups to realize innovative services (mainly for students).

### Organizational issues

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## T

## 8.4 Course: Advanced Lab Security, Usability and Society [T-WIWI-108439]

**Responsible:** Prof. Dr. Melanie Volkamer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	see Annotations	2

Events					
ST 2024	2512554	<a href="#">Practical lab Security, Usability and Society (Bachelor)</a>	3 SWS	Practical course / 📱	Volkamer, Strufe, Mayer, Berens, Mossano, Hennig, Veit, Länge
WT 24/25	2512554	<a href="#">Praktikum Security, Usability and Society (Bachelor)</a>	3 SWS	Practical course / 🔄	Volkamer, Strufe, Berens, Länge, Mossano, Hennig, Hilt, Veit
WT 24/25	2512555	<a href="#">Praktikum Security, Usability and Society (Master)</a>	3 SWS	Practical course / 🔄	Volkamer, Strufe, Berens, Länge, Mossano, Hennig, Hilt, Veit
Exams					
ST 2024	7900029	<a href="#">Practical lab Security, Usability and Society (Bachelor)</a>			Volkamer
WT 24/25	7900116	<a href="#">Advanced Lab Security, Usability and Society (Bachelor)</a>			Volkamer
WT 24/25	7900307	<a href="#">Advanced Lab Security, Usability and Society (Master)</a>			Volkamer

Legend: 📱 Online, 🔄 Blended (On-Site/Online), 📍 On-Site, ✕ Cancelled

### Competence Certificate

The alternative exam assessment consists of:

- a practical work
- a presentation and possibly
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

### Prerequisites

None

### Recommendation

Knowledge from the lecture "Information Security" is recommended.

### Annotation

The course will not be offered in the summer semester 2023.

Below you will find excerpts from events related to this course:

## V

### Practical lab Security, Usability and Society (Bachelor)

2512554, SS 2024, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)  
Online

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Topics:

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Title: NoPhish App

Number of students: 2 Ba/Ma

Description: The NoPhish app was one of the first measures from the NoPhish concept. The app has been around for a long time and has not been updated since then. Accordingly, the task of the project is to make the app functional for the current Android version. The app is also to be optimised so that updates, e.g. new chapters, can be added easily.

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In this subject, students develop a part of coding, an extension, or another programming task dealing with various usable security interventions, e.g. as an extension like TORPEDO ( <https://secuso.aifb.kit.edu/english/TORPEDO.php> ) or PassSec + ( <https://secuso.aifb.kit.edu/english/PassSecPlus.php> ). Just as before, students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: Hacking TORPEDO

Number of students: 1-2 Ba/Ma

Description: TORPEDO has existed for many years both as a Thunderbird add-on and as a web extension. TORPEDO is intended to help address various forms of phishing attacks and thereby protect the user, e.g. against various manipulations of the domain or additional tooltips. However, no targeted attacks on TORPEDO have yet been found. The aim of the work is to subject TORPEDO to a stress test and also to develop attacks that specifically target the implementation of TORPEDO.

### Run Usable Security Studies and Results Analysis

These topics are related to run and analyse the results of user-studies. Online studies, interviews and lab studies are all possible, depending on the topic. At the end of the semester, the students present a report / paper with the analyses conducted and a talk in which they present the results.

Title: Visualization of Eye Gaze Patterns during Authentication Tasks

Number of students: 1 Ba/Ma

Description: In this project, students will analyze and visualize eye gaze data collected during two specific authentication tasks: the Dot Task and the Slider Task. The primary objective is to represent subjects' eye movements visually, enhancing the understanding of gaze patterns during the authentication process. *\*Dot Task Visualization:\** For the Dot Task, participants were instructed to focus on a sequence of dots displayed on a screen. The dataset includes the positions of these dots and the corresponding gaze locations of the subjects. The student's task is to create a dynamic visualization that not only represents these positions accurately but also illustrates the sequence in which the dots were focused on by the subjects. *\*Slider Task Visualization:\** The Slider Task involved presenting participants with a series of images, for which both the images' locations on the screen and the subjects' gaze locations are recorded. The challenge is to develop a heatmap visualization based on this data, effectively demonstrating the concentration and dispersion of gaze points across different images.

Title: Compare BSI Phishing Game with the NoPhish Game

Number of students: 1 Ba

Description: The NoPhish app, one of the first implementations of the NoPhish concept, is a form of serious game. The BSI has also developed a game in the field of phishing. Both "games" use different approaches to impart knowledge from the same context. The aim is to evaluate the two games in terms of similarities and differences.

Title: Phishing Advice from Organizations (English Only)

Number of students: 1 Ba

Description: Many companies distribute information on how to recognise phishing via various channels such as e-mails, e.g. Amazon or Telekom. The question arises as to how helpful these tips are in reality. Are they too specific to the context of the company or so abstractly formulated that they are of no real help to users? The aim of the work is to collect various hints and then compare them with the hints of the NoPhish concept in order to find differences and similarities between the hints and the concept.

Title: Chatbots for Literature Reviews

Number of students: 1 Ba

Description: Chatbots are becoming increasingly popular and are already being used in various areas. But in what form can these bots be used for science? The variety of chatbots also raises the question of whether there are chatbots that are better suited to a scientific context. The aim is to identify a selection of chatbots and evaluate them in terms of their effectiveness for future literature research. To this end, the results of the chatbots will be compared with the ACM database in order to check their effectiveness for finding literature for a specific period of time.

Title: Phishing through homographic attacks in messengers and social networks

Number of students: 1-2 Ba/Ma

Description: The task will be to test three types of attacks in messengers and social networks that work in some email clients. First is the link mismatch attack, where the link text differs from the actual link target. Second is an attack in which the actual link target is disguised by URL encoding [[https://en.wikipedia.org/wiki/URL\\_encoding](https://en.wikipedia.org/wiki/URL_encoding)], and finally homographic attacks which uses Internationalized Domain Names [[https://en.wikipedia.org/wiki/IDN\\_homograph\\_attack](https://en.wikipedia.org/wiki/IDN_homograph_attack)], in which Latin characters are replaced by characters of a different alphabet in the domain name. The attacks are predefined, so no knowledge of phishing techniques is required.

Title: Usability Study of Mobile Authentication for Elderly Users with Rheumatoid Arthritis (English only)

Number of students: 1 Ba/Ma

Description: Authentication is an ever important topic, especially in the mobile context. However, it becomes even more relevant when considering accessibility to it. Nowadays, a common authentication method is using a PIN. Yet, given the low hand mobility of users affected by rheumatoid arthritis, sometimes using PINs can be difficult. In this topic, the student will conduct several sessions of an already designed lab study with various participants using arthritis simulation gloves to evaluate three PIN-pad interfaces aimed at making authentication more accessible. The study will also investigate the preferences of users regarding PIN-pad interfaces through drawings and proposals of changes. The student will then analyse the results through inferential statistics. Depending on the quality of the outcome, the results will then be published in a paper and the student will be added to the authors list.

This event counts towards the KASTEL certificate. Further information on how to obtain the certificate can be found on the SECUSO website ([https://secuso.aifb.kit.edu/Studium\\_und\\_Lehre.php](https://secuso.aifb.kit.edu/Studium_und_Lehre.php)).



### Praktikum Security, Usability and Society (Bachelor)

2512554, WS 24/25, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)  
Blended (On-Site/Online)

## Content

The Praktikum Security, Usability and Society will cover topics both of usable security and privacy programming, and how to conduct user studies. To reserve a place, please, register on the WiWi portal and send an email with your chosen topic, plus a back-up one, to [mattia.mossano@kit.edu](mailto:mattia.mossano@kit.edu). Topics are assigned first-come-first-served until all of them are filled. Topics in italics have already been assigned.

### There are two rounds to apply:

Summer round closes on 16.07.2023. Assignment will be done by 17.07.2023 and confirmation must be received by 21.07.2023.

Autumn round opens 11.09.2023 and closes on 08.10.2023. Assignment will be done by 09.10.2023 and confirmation must be received by 13.10.2023.

### Important dates:

Kick-off: 05.10.2023, 09:00 AM CET in Big Blue Button - [Link](#)

Report & code feedback deadline: 01.03.2024, 23:59 CET

Feedback on Report & code: 08.03.2024, 23:59 CET

Final report + code deadline: 15.03.2024, 23:59 CET

Presentation draft deadline: 15.03.2024, 23:59 CET

Feedback on presentation draft: 19.03.2024, 23:59 CET

Final presentation deadline: 22.03.2024, 23:59 CET

Presentation day: 29.03.2024, 09:00 CET

Topics:

### Privacy Friendly apps

In this subject, students complete an app (or an extension of an app) among our Privacy-Friendly Apps. Please click the following link to know more about them: <https://secuso.aifb.kit.edu/english/105.php>. Students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: *Notes 2.0*

Number of students: 1 Bachelor

Description: Update und Vorbereitung zur Veröffentlichung der Notes 2.0-App.

### Designing Security User studies

These topics are related to how to set up and conduct user studies of various types. Online studies, interviews and lab studies are possible. At the end of the semester, the students present a report / paper and a talk in which they present their methodologies and the results of small pre-studies.

Title: Designing User Studies for Evaluating Biometric Authentication Systems

Number of students: 1 Bachelor or Master level

Description: The proposed topic focuses on designing and implementing a user study methodology to evaluate the usability and user perception of biometric authentication systems. Biometric authentication involves using unique physiological or behavioral characteristics, such as fingerprints, facial recognition, or voice patterns, to verify a user's identity. The goal of this research is to understand the factors that affect the effectiveness and acceptance of biometric authentication and provide insights for designing user-friendly and secure biometric authentication systems.

Title: How useful are security advice given by ChatGPT?

Number of students: 1-2 Bachelor level

Description: ChatGPT is nowadays used for multiple reasons. One of them is to obtain advice on security decision, asking the program how to be best defend oneself. However, what are these advice based on? And more importantly, is the quality of the advice in line with the best practices or are they misleading? The goal of this topic is to design an expert study where various advice given by ChatGPT on security topics (e.g., password policies, phishing, etc.) are compared against the advice of experts. The results then need to be analysed and classified to determine the quality of ChatGPT advice.

### Run Usable Security Studies and Results Analysis

These topics are related to run and analyse the results of user-studies. Online studies, interviews and lab studies are all possible, depending on the topic. At the end of the semester, the students present a report / paper with the analyses conducted and a talk in which they present the results.

Title: Phishing through homographic attacks in messengers and social networks

Number of students: 1-2 Bachelor or Master level

Description: The task will be to test three types of attacks in messengers and social networks that work in some email clients. First is the link mismatch attack, where the link text differs from the actual link target. Second is an attack in which the actual link target is disguised by URL encoding [[https://en.wikipedia.org/wiki/URL\\_encoding](https://en.wikipedia.org/wiki/URL_encoding)], and finally homographic attacks which uses Internationalized Domain Names [[https://en.wikipedia.org/wiki/IDN\\_homograph\\_attack](https://en.wikipedia.org/wiki/IDN_homograph_attack)], in which Latin characters are replaced by characters of a different alphabet in the domain name. The attacks are predefined, so no knowledge of phishing techniques is required.

Title: Usability Study of Mobile Authentication for Elderly Users with Rheumatoid Arthritis (English only)

Number of students: 1 Bachelor or Master level

Description: Authentication is an ever important topic, especially in the mobile context. However, it becomes even more relevant when considering accessibility to it. Nowadays, a common authentication method is using a PIN. Yet, given the low hand mobility of users affected by rheumatoid arthritis, sometimes using PINs can be difficult. In this topic, the student will conduct several sessions of an already designed lab study with various participants using arthritis simulation gloves to evaluate three PIN-pad interfaces aimed at making authentication more accessible. The study will also investigate the preferences of users regarding PIN-pad interfaces through drawings and proposals of changes. The student will then analyse the results through inferential statistics. Depending on the quality of the outcome, the results will then be published in a paper and the student will be added to the authors list.

This event counts towards the KASTEL certificate. Further information on how to obtain the certificate can be found on the SECUSO website ([https://secuso.aifb.kit.edu/Studium\\_und\\_Lehre.php](https://secuso.aifb.kit.edu/Studium_und_Lehre.php)).



### Praktikum Security, Usability and Society (Master)

2512555, WS 24/25, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)  
Blended (On-Site/Online)



**Content**

The Praktikum Security, Usability and Society will cover topics both of usable security and privacy programming, and how to conduct user studies. To reserve a place, please, register on the WiWi portal and send an email with your chosen topic, plus a back-up one, to [mattia.mossano@kit.edu](mailto:mattia.mossano@kit.edu). Topics are assigned first-come-first-served until all of them are filled. Topics in italics have been already assigned.

**There are two deadlines:**

Summer round closes on 16.07.2023. Assignment will be done by 17.07.2023 and confirmation must be received by 21.07.2023.

Autumn round opens 11.09.2023 and closes on 08.10.2023. Assignment will be done by 09.10.2023 and confirmation must be received by 13.10.2023.

**Important dates:**

Kick-off: 05.10.2023, 09:00 AM CET in Big Blue Button - [Link](#)

Report & code feedback deadline: 01.03.2024, 23:59 CET

Feedback on Report & code: 08.03.2024, 23:59 CET

Final report + code deadline: 15.03.2024, 23:59 CET

Presentation draft deadline: 15.03.2024, 23:59 CET

Feedback on presentation draft: 19.03.2024, 23:59 CET

Final presentation deadline: 22.03.2024, 23:59 CET

Presentation day: 29.03.2024, 09:00 CET

**Topics:****Programming Usable Security Intervention**

In this subject, students develop a part of coding, an extension, or another programming task dealing with various usable security interventions, eg as an extension. Eg TORPEDO ( <https://secuso.aifb.kit.edu/english/TORPEDO.php> ) or PassSec + ( <https://secuso.aifb.kit.edu/english/PassSecPlus.php> ). Just as before, students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: Making e-mails more visible by embedding moving images

Number of students: 1 Master

Description: In case of a security incident, it is necessary to inform the affected persons about their vulnerabilities as soon as possible. Within the context of the INSPECTION project, we are currently informing website owners via e-mail about security related vulnerabilities on their websites. Although e-mails have been shown to be the most cost-efficient means to deliver such information, they have not lead to an appropriate remediation rate. While speaking to the affected website owners we learned that they would appreciate more information, although not being delivered as more text in the e-mail. Also, we learned that most e-mails were not read because they were considered spam. Thus, we need to find a way to make e-mail notifications more effective in raising peoples' awareness. Videos have been proven effective to raise awareness in the context of IT security. The goal of the project will be, to explore ways to embed videos in an e-mail via HTML (either as gifs or as preview to a YouTube video). The challenge is to make this e-mail readable for different clients and webmail as well as getting it delivered through spam filters.

**Designing Security User studies**

These topics are related to how to set up and conduct user studies of various types. Online studies, interviews and lab studies are possible. At the end of the semester, the students present a report / paper and a talk in which they present their methodologies and the results of small pre-studies.

Title: Designing User Studies for Evaluating Biometric Authentication Systems

Number of students: 1 Bachelor or Master level

Description: The proposed topic focuses on designing and implementing a user study methodology to evaluate the usability and user perception of biometric authentication systems. Biometric authentication involves using unique physiological or behavioral characteristics, such as fingerprints, facial recognition, or voice patterns, to verify a user's identity. The goal of this research is to understand the factors that affect the effectiveness and acceptance of biometric authentication and provide insights for designing user-friendly and secure biometric authentication systems.

Title: Can anxiety influences security advices

Number of students: 1 Master level

Description: Nowadays ChatGPT is used for a multitude of reasons. One is to ask advice on security topics. However, previous research showed that oftentimes ChatGPT creates answers based on previous interactions with it. Therefore, is it possible that also security advice change according to the previous interaction? And if this is the case, can more anxious props lead to completely different results? The student will have to read the previous literature on ChatGPT, find expert advice on security topics and create an experiment to determine if anxiety influenced the advice given by ChatGPT.

Title: Investigating ChatGPT privacy tradeoffs and users perception of them (English only)

Number of students: 1 Master level

Description: As ChatGPT grows in popularity, it becomes increasingly vital to examine the privacy trade-offs associated with its usage. The user's willingness to accept these trade-offs is instrumental in understanding the wider implications of employing AI language models. This topic involves a two-part exploration into the privacy trade-offs of using ChatGPT. Initially, the student will analyse ChatGPT's Terms and Conditions and conduct a short literature review to identify potential privacy trade-offs. The found trade-offs need to be categorised into a set of trade-offs that will be investigated. Subsequently, the student will design an online user study, incorporating various question types and a deception study, to gauge the willingness of ChatGPT users to accept these trade-offs. Finally, the student will test the designed online user study in the course of small pre-test.

### Run Usable Security Studies and Results Analysis

These topics are related to run and analyse the results of user-studies. Online studies, interviews and lab studies are all possible, depending on the topic. At the end of the semester, the students present a report / paper with the analyses conducted and a talk in which they present the results.

Title: Phishing through homographic attacks in messengers and social networks

Number of students: 1-2 Bachelor or Master level

Description: The task will be to test three types of attacks in messengers and social networks that work in some email clients. First is the link mismatch attack, where the link text differs from the actual link target. Second is an attack in which the actual link target is disguised by URL encoding [[https://en.wikipedia.org/wiki/URL\\_encoding](https://en.wikipedia.org/wiki/URL_encoding)], and finally homographic attacks which uses Internationalized Domain Names [[https://en.wikipedia.org/wiki/IDN\\_homograph\\_attack](https://en.wikipedia.org/wiki/IDN_homograph_attack)], in which Latin characters are replaced by characters of a different alphabet in the domain name. The attacks are predefined, so no knowledge of phishing techniques is required.

Title: Usability Study of Mobile Authentication for Elderly Users with Rheumatoid Arthritis (English only)

Number of students: 1 Bachelor or Master level

Description: Authentication is an ever important topic, especially in the mobile context. However, it becomes even more relevant when considering accessibility to it. Nowadays, a common authentication method is using a PIN. Yet, given the low hand mobility of users affected by rheumatoid arthritis, sometimes using PINs can be difficult. In this topic, the student will conduct several sessions of an already designed lab study with various participants using arthritis simulation gloves to evaluate three PIN-pad interfaces aimed at making authentication more accessible. The study will also investigate the preferences of users regarding PIN-pad interfaces through drawings and proposals of changes. The student will then analyse the results through inferential statistics. Depending on the quality of the outcome, the results will then be published in a paper and the student will be added to the authors list.

This event counts towards the KASTEL certificate. Further information on how to obtain the certificate can be found on the SECUSO website ([https://secuso.aifb.kit.edu/Studium\\_und\\_Lehre.php](https://secuso.aifb.kit.edu/Studium_und_Lehre.php)).

T


## 8.5 Course: Advanced Lab Sociotechnical Information Systems Development (Bachelor) [T-WIWI-111124]

**Responsible:** Prof. Dr. Ali Sunyaev

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-101426 - Electives in Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	1

Events					
WT 24/25	2512400	<a href="#">Practical Course Sociotechnical Information Systems Development (Bachelor)</a>	3 SWS	Practical course / 	Sunyaev, Goram, Leiser
Exams					
ST 2024	7900016	<a href="#">Advanced Lab Development of Sociotechnical Information Systems (Bachelor)</a>			Sunyaev
WT 24/25	7900080	<a href="#">Advanced Lab Development of Sociotechnical Information Systems (Bachelor)</a>			Sunyaev

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

The alternative exam assessment consists of:

- a practical work
- a presentation and
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

### Prerequisites

None

## T

## 8.6 Course: Advanced Programming - Application of Business Software [T-WIWI-102748]

**Responsible:** Prof. Dr. Stefan Klink  
Prof. Dr. Andreas Oberweis

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-105112 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2511026	<a href="#">Advanced Programming - Application of Business Software</a>	2 SWS	Lecture / 🗣️	Klink
WT 24/25	2511027	<a href="#">Exercises Advanced Programming - Application of Business Software</a>	1 SWS	Practice / 🗣️	Ullrich
WT 24/25	2511028	<a href="#">Computer lab Advanced Programming - Application of Business Software</a>	2 SWS	Practice / 🔄	Schreiber, Ullrich
Exams					
ST 2024	7900049	<a href="#">Advanced Programming - Application of Business Software</a>			Klink
WT 24/25	7900019	<a href="#">Advanced Programming - Application of Business Software</a>			Oberweis

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✕ Cancelled

### Competence Certificate

The success control takes place in the form of a written examination. The duration of the exam is 60 minutes. The examination is offered every semester and can be repeated at any regular examination date.

The prerequisite for taking the exam is successful participation in a computer lab during the lecture in the winter semester. Attendance is compulsory for individual dates of the computer lab. More detailed information on registration to the computer lab and exercise sessions will be announced in the first lecture and on the lecture homepage on ILIAS.

Admission to take the exam can only be acquired in the winter semester and is valid indefinitely.

### Prerequisites

This course cannot be taken together with *Advanced Programming - Java Network Programming*.

### Recommendation

Knowledge of the course "Foundations of Informatics I und II" are helpful.

Below you will find excerpts from events related to this course:

## V

### Advanced Programming - Application of Business Software

2511026, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

Business information systems enable, support, and accelerate new forms of business processes and forms of organisation. They are the central infrastructure of the economy in the age of eBusiness. Thus, basic knowledge is given in lectures, in exercises and in the computer lab which deals with installation, configuration and parameterization of business information systems. The course communicates profound knowledge in following topics:

- Analysis of cooperation scenarios and business process scenarios
- Selection of modelling methods according to defined criteria
- Implementation of business process models and cooperation models with the help of standard software
- Identification and assessment of challenges during the installation of information systems
- Economical evaluation of business information systems.

This course cannot be taken together with *Advanced Programming - Java Network Programming* [2511020].

**Learning objectives:**

Students

- explain basic concepts and principles of enterprise information systems,
- describe the components of enterprise information systems,
- assess economical aspects of such systems,
- apply standard software for modelling business processes and for analysing them to given criteria.

**Recommendations:**

Knowledge of the courses "Grundlagen der Informatik I und II" are helpful.

**Notes:**

- No registration is required for the lecture
- An registration is required for the exercises for participation in the Computer Lab and the subsequent exam admission
- The registration phase for the exercises starts in the first week after lecture begin and ends with the first exercise session
- Important informations regarding the registration, exact dates and deadlines will be communicated on the lecture website (LIAS)

**Workload:**

- Lecture 30h
- Exercise course 15h
- Review and preparation of lectures 23h
- Review and preparation of exercises 10h
- Computer Lab 30h
- Exam preparation 26h
- Exam 1h
- Total 135h
- Exercise courses are done by student tutors

**Literature**

- Schönthaler, Vossen, Oberweis, Karle: Business Processes for Business Communities: Modeling Languages, Methods, Tools. Springer 2012.
- Hasenkamp, Stahlknecht: Einführung in die Wirtschaftsinformatik. Springer 2012.
- Hansen, Neumann: Wirtschaftsinformatik I. Grundlagen betrieblicher Informationsverarbeitung. UTB 2009.
- Mertens et al.: Grundzüge der Wirtschaftsinformatik. Springer 2012.

Weitere Literatur wird in der Vorlesung bekannt gegeben.

## T

## 8.7 Course: Advanced Programming - Java Network Programming [T-WIWI-102747]

**Responsible:** Prof. Dr. Dietmar Ratz  
Prof. Dr.-Ing. Johann Marius Zöllner

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-105112 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	5

Events					
ST 2024	2511020	<a href="#">Advanced Programming - Java Network Programming</a>	2 SWS	Lecture /	Ratz
ST 2024	2511021	<a href="#">Tutorium zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java</a>	1 SWS	Tutorial ( /	Ratz, Stegmaier, Schneider, Mütsch
ST 2024	2511023	<a href="#">Rechnerpraktikum zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java</a>	2 SWS	/	Ratz, Stegmaier, Schneider, Mütsch
Exams					
ST 2024	7900041	<a href="#">Advanced Programming - Java Network Programming</a>			Ratz
WT 24/25	7900020	<a href="#">Advanced Programming - Java Network Programming</a>			Ratz

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

At the end of the lecture period, a written examination (90 min.) is offered (according to §4(2), 1 SPO), for which - through successful participation in the exercises during the semester - admission must be obtained. The exact details will be announced in the lecture. The examination is offered every semester and can be repeated at any regular examination date.

A bonus can be earned through successful participation in the exercises. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). Details will be announced in the lecture

### Prerequisites

This course cannot be taken together with [Advanced Programming - Application of Business Software](#)[2511026].

### Annotation

The registration for the participation in the computer lab (precondition for the exam participation) already takes place in the first lecture week!

Below you will find excerpts from events related to this course:

## V

## Advanced Programming - Java Network Programming

2511020, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

In the lecture, the exercises and computer labs to this course the practical handling with the programming language Java dominating within the range of economical applications is obtained. The basis for this is the current language standard. The knowledge from the lecture Introduction to Programming with Java will be deepened and extended. This is done, among other things, by addressing commercially relevant topics such as object-oriented modeling and programming, class hierarchy and inheritance, threads, applications and applets, AWT and Swing components for graphical user interfaces, exception and event processing, lambda expressions, input/output via streams, applications in networks, Internet communication, client and server programming, remote method invocation, servlets, Java Server Pages and Enterprise Java Beans.

This course cannot be taken together with *Advanced Programming - Application of Business Software* [2540886/2590886].

**Learning objectives:**

- Students learn the practical use of the object-oriented programming language Java and are enabled to design and implement component-based Internet applications using the latest technologies and tools.
- The ability to select and design these methods and systems appropriate to the situation and to use them for solving problems is imparted.
- Students are empowered to find strategic and creative answers in the search for solutions to well-defined, concrete and abstract problems.

**Workload:**

The total workload for this course is approximately 150 hours.

**Organizational issues**

Die Anmeldung zur Teilnahme am Rechnerpraktikum (Vorbedingung zur Klausurteilnahme) findet bereits in der ersten Vorlesungswoche statt!

**Literature**

Ratz, D. Schulmeister-Zimolong, D. Seese, J. Wiesenberger. Grundkurs Programmieren in Java. 8. Aktualisierte und erweiterte Auflage, Hanser 2018.

**Weiterführende Literatur:**

- S. Zakhour, S. Hommel, J. Royal. Das Java Tutorial. Addison Wesley 2007
- W. Eberling, J. Lessner. Enterprise JavaBeans 3. Hanser Verlag 2007.
- R. Oechsle. Parallele und verteilte Anwendungen. 2. Auflage. Hanser Verlag 2007.
- Weitere Literatur wird in der Vorlesung bekannt gegeben.

## T

## 8.8 Course: Advanced Topics in Economic Theory [T-WIWI-102609]

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101501 - Economic Theory](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Irregular	1

Events					
ST 2024	2520527	<a href="#">Advanced Topics in Economic Theory</a>	2 SWS	Lecture / 🗎	Mitusch, Brumm
ST 2024	2520528	<a href="#">Übung zu Advanced Topics in Economic Theory</a>	1 SWS	Practice / 🗎	Pegorari, Corbo
Exams					
ST 2024	00227	<a href="#">Advanced Topics in Economic Theory</a>			Mitusch, Brumm
ST 2024	7900329	<a href="#">Advanced Topics in Economic Theory</a>			Mitusch, Brumm

Legend: 🗎 Online, 🗎 Blended (On-Site/Online), 🗎 On-Site, ✕ Cancelled

### Competence Certificate

The assessment consists of a written exam (60min) (following §4(2), 1 of the examination regulation) at the end of the lecture period or at the beginning of the following semester.

### Prerequisites

None

### Recommendation

This course is designed for advanced Master students with a strong interest in economic theory and mathematical models. Bachelor students who would like to participate are free to do so, but should be aware that the level is much more advanced than in other courses of their curriculum.

Below you will find excerpts from events related to this course:

## V

### Advanced Topics in Economic Theory

2520527, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

### Literature

Die Veranstaltung wird in englischer Sprache angeboten:

The course is based on the excellent textbook "Microeconomic Theory" (Chapters 1-5, 10, 13-20) by A.Mas-Colell, M.D.Whinston, and J.R.Green.



T

## 8.9 Course: Analysis of Social Structures (WiWi) [T-GEISTSOZ-109047]

**Responsible:** Prof. Dr. Gerd Nollmann**Organisation:** KIT Department of Humanities and Social Sciences**Part of:** [M-GEISTSOZ-101167 - Sociology/Empirical Social Research](#)

Type
Written examination

Credits
3





Grading scale
Grade to a third

Recurrence
Each winter term

Version
1

## Events

WT 24/25	5011007	<a href="#">Analysis of Social Structures</a>	2 SWS	Practice / 	Nollmann
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Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T


## 8.10 Course: Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines [T-MACH-105173]




**Responsible:** Dr.-Ing. Marcus Gohl

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	1

Events					
ST 2024	2134150	<a href="#">Gas, lubricating oil and operating media analysis in drive train development</a>	2 SWS	Lecture / 	Gohl

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Letter of attendance or oral exam (25 minutes, no auxiliary means)

### Prerequisites

none

Below you will find excerpts from events related to this course:

V

### Gas, lubricating oil and operating media analysis in drive train development

2134150, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Literature

Die Vorlesungsunterlagen werden vor jeder Veranstaltung an die Studenten verteilt.

## T

## 8.11 Course: Analysis of Multivariate Data [T-WIWI-103063]

**Responsible:** Prof. Dr. Oliver Grothe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101599 - Statistics and Econometrics](#)  
[M-WIWI-105414 - Statistics and Econometrics II](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Irregular	1

Events					
ST 2024	2550550		2 SWS	Lecture /	Grothe
ST 2024	2550551		2 SWS	Practice /	Grothe, Kaplan, Liu
Exams					
ST 2024	7900033	<a href="#">Analysis of Multivariate Data</a>			Grothe
WT 24/25	7900297	<a href="#">Analysis of Multivariate Data</a>			Grothe

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. The exam is offered every semester. Re-examinations are offered only for repeaters.

**Prerequisites**

None

**Recommendation**

Attendance of the courses Statistics 1 [2600008] and Statistics 2 [2610020] is recommended.

**Annotation**

The lecture is not offered regularly. The courses planned for three years in advance can be found online.

Below you will find excerpts from events related to this course:

## V

2550550, SS 2024, 2 SWS, [Open in study portal](#)

Lecture (V)  
On-Site


**Literature**




Skript zur Vorlesung

T

## 8.12 Course: Analysis Tools for Combustion Diagnostics [T-MACH-105167]

**Responsible:** Jürgen Pfeil**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101303 - Combustion Engines II](#)**Type**  
Oral examination**Credits**  
4**Grading scale**  
Grade to a third**Recurrence**  
Each summer term**Version**  
1

Events					
ST 2024	2134134	<a href="#">Analysis tools for combustion diagnostics</a>	2 SWS	Lecture / 	Pfeil
Exams					
ST 2024	76-T-MACH-105167	<a href="#">Analysis Tools for Combustion Diagnostics</a>			Koch

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

oral examination, Duration: 25 min., no auxiliary means

**Prerequisites**

none

*Below you will find excerpts from events related to this course:*

V

**Analysis tools for combustion diagnostics**2134134, SS 2024, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**  
On-Site**Literature**



Skript, erhältlich in der Vorlesung





T

## 8.13 Course: Applied Informatics – Applications of Artificial Intelligence [T-WIWI-110340]

**Responsible:** Dr.-Ing. Tobias Käfer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2511314	<a href="#">Applied Informatics - Applications of Artificial Intelligence</a>	2 SWS	Lecture / 	Käfer, Kinder
WT 24/25	2511315	<a href="#">Exercises to Applied Informatics - Applications of Artificial Intelligence</a>	1 SWS	Practice / 	Käfer, Qu
Exams					
ST 2024	79AIFB_AKI_C1	<a href="#">Applied Informatics - Applications of AI (Registration until 15 July 2024)</a>			Käfer
WT 24/25	79AIFB_AKI_C1	<a href="#">Applied Informatics – Applications of Artificial Intelligence</a>			Käfer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Written Examination (60 min) according to §4, Abs. 2, 1 of the examination regulations or oral examination of 20 minutes according to §4, Abs. 2, 2 of the examination regulations. The exam takes place every semester and can be repeated at every regular examination date.

### Prerequisites

None.

### Recommendation

Basics in logic, e.g. from lecture Foundations of Informatics 1 are important.

Below you will find excerpts from events related to this course:

V

### Applied Informatics - Applications of Artificial Intelligence

2511314, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
Blended (On-Site/Online)

**Content**

The lecture provides insights into the fundamentals of artificial intelligence. Basic methods of artificial intelligence and their applications in industry are presented.

Applications of the AI is a sub-area of computer science dealing with the automation of intelligent behavior. In general, it is a question of mapping human intelligence. Methods of artificial intelligence are presented in various areas such as, for example, question answering systems, speech recognition and image recognition.

The lecture gives an introduction to the basic concepts of artificial intelligence. Essential theoretical foundations, methods and their applications are presented and explained.

This lecture aims to provide students with a basic knowledge and understanding of the structure, analysis and application of selected methods and technologies on artificial intelligence. The topics include, among others, knowledge modeling, machine learning, text mining, uninformed search, and intelligent agents.

**Learning objectives:**

The students

- consider current research topics in the field of artificial intelligence and in particular learn about the topics of knowledge modeling, machine learning, text mining and uninformed search.
- interdisciplinary thinking.
- technological approaches to current problems.

**Workload:**

- The total workload for this course is approximately 135 hours
- Time of presentness: 45 hours
- Time of preparation and postprocessing: 60 hours
- Exam and exam preparation: 30 hours

**Exercises to Applied Informatics - Applications of Artificial Intelligence**

2511315, WS 24/25, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)  
On-Site

**Content**

The exercises are oriented on the lecture applications of AI.

Multiple exercises are held that capture the topics, held in the lecture Applications of AI and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

This lecture aims to provide students with a basic knowledge and understanding of the structure, analysis and application of selected methods and technologies on artificial intelligence. The topics include, among others, knowledge modeling, machine learning, text mining, uninformed search, and intelligent agents.

**Learning objectives:**

The students

- consider current research topics in the field of artificial intelligence and in particular learn about the topics of knowledge modeling, machine learning, text mining and uninformed search.
- interdisciplinary thinking.
- technological approaches to current problems.

**8.14 Course: Applied Informatics – Database Systems [T-WIWI-110341]**

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2024	2511200	<a href="#">Applied Informatics - Database Systems</a>	2 SWS	Lecture /	Sommer
ST 2024	2511201	<a href="#">Exercises Applied Informatics - Database Systems</a>	1 SWS	Practice /	Sommer
Exams					
ST 2024	79AIFB_DBS_B1	<a href="#">Applied Informatics - Database Systems (Registration until 15 July 2024)</a>			Oberweis
WT 24/25	79AIFB_DBS_C5	<a href="#">Applied Informatics – Database Systems</a>			Oberweis

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 minutes) in the first week after lecture period.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-WIWI-102660 - Database Systems](#) must not have been started.

**Annotation**

Replaces from summer semester 2020 T-WIWI-102660 "Database Systems".

Below you will find excerpts from events related to this course:

**Applied Informatics - Database Systems**

2511200, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

Database systems (DBS) play an important role in today's companies. Internal and external data is stored and processed in databases in every company. The proper management and organization of data helps to solve many problems, enables simultaneous queries from multiple users and is the organizational and operational base for the entire working procedures and processes of the company. The lecture leads in the area of the database theory, covers the basics of database languages and database systems, considers basic concepts of object-oriented and XML databases, conveys the principles of multi-user control of databases and physical data organization. In addition, it gives an overview of business problems often encountered in practice such as:

- Correctness of data (operational, semantic integrity)
- Restore of a consistent database state
- Synchronization of parallel transactions (phantom problem).

**Learning objectives:**

Students

- are familiar with the concepts and principles of data base models, languages and systems and their applications and explain it,
- design and model relational data bases on the basis of theoretical foundations,
- create queries for relational databases,
- know how to handle enhanced data base problems occurring in the enterprises.

**Workload:**

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

**Literature**

- Schlageter, Stucky. Datenbanksysteme: Konzepte und Modelle. Teubner 1983.
- S. M. Lang, P. C. Lockemann. Datenbankeinsatz. Springer-Verlag 1995.
- Jim Gray, Andreas Reuter. Transaction Processing: Concepts and Techniques. Morgan Kaufmann 1993.

Weitere Literatur wird in der Vorlesung bekannt gegeben.

**Exercises Applied Informatics - Database Systems**

2511201, SS 2024, 1 SWS, Language: German, [Open in study portal](#)

**Practice (Ü)  
On-Site**

**Content**

Database systems (DBS) play an enormously important role in today's companies. The internal and external data is stored and processed in the database of the respective company. The correct management and organization of this data helps to solve numerous problems, enables simultaneous queries by several users and is the organizational and operational basis for the entire workflows and processes of the company.

The lecture introduces the field of database theory, covers the basics of database languages and database systems, teaches the principles of multi-user database control and physical data organization. In addition, it provides an overview of database problems often encountered in business practice, such as the correctness of data (operational, semantic integrity), the recovery of a consistent database state, and the synchronization of parallel transactions.

**Literature**

Schlageter / Stucky: Datenbanksysteme: Konzepte und Modelle, 2. Auflage, Teubner, Stuttgart, 1983 P. C. Lockemann / J. W. Schmidt (Hrsg.): Datenbank-Handbuch, Springer-Verlag, 1987 S. Cannan / G. Otten: SQL - The Standard Handbook, McGraw-Hill, 1993 Jim Gray / Andreas Reuter: Transaction Processing: Concepts and Techniques, Morgan Kaufmann, 1993 S. M. Lang / P. C. Lockemann: Datenbankeinsatz, Springer-Verlag, 1995 Ramez Elmasri / Shamkant B. Navathe: Fundamentals of Database Systems, Addison-Wesley, 1994 und 2000



## T

## 8.15 Course: Applied Informatics – Information Security [T-WIWI-110342]

**Responsible:** Prof. Dr. Melanie Volkamer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	4

Events					
ST 2024	2511550	<a href="#">Applied Informatics - Information Security</a>	2 SWS	Lecture / 🗣️	Volkamer
ST 2024	2511551	<a href="#">Exercise Applied Informatics - Information Security</a>	1 SWS	Practice / 🗣️	Volkamer, Berens, Ballreich
Exams					
ST 2024	79AIFB_IS_A1	<a href="#">Applied Informatics - Information Security (Registration until 15 July 2024)</a>			Volkamer
WT 24/25	79AIFB_IS_A2	<a href="#">Applied Informatics – Information Security</a>			Volkamer

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✖ Canceled

### Competence Certificate

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (30 min) following §4, Abs. 2, 2 of the examination regulation, for which admission must be obtained through successful participation in the exercise during the semester.

The exam takes place every semester and can be repeated at every regular examination date.

### Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-WIWI-108387 - Information Security](#) must not have been started.

### Annotation

#### Competence Goal

The student

- can explain and apply the basics of information security
- knows appropriate measures to achieve different protection goals and can implement these measures
- can assess the quality of organizational protective measures, i.e. among other things
- knows what has to be taken into account when using the individual measures
- understands the differences between information security in the enterprise and in the private context
- knows the areas of application of a variety of relevant standards and knows their weaknesses
- knows and can explain the problems of information security which may arise from human-machine interaction
- can assess messages about detected security problems in a critical way
- can structure a software project in the field of information security and explain and present results in oral and written form
- can use the techniques of Human Centred Security and Privacy by Design to create user-friendly software.

### Content

- Basics and concepts of information security
- Understanding the protection objectives of information security and various attack models (including associated assumptions)
- introduction of measures to achieve the respective protection goals, taking into account different attack models
- Note: In contrast to the IT Security lecture, measures such as encryption algorithms are treated only abstractly, i.e. the idea of the measure, assumptions to the attacker and the deployment environment.
- Presentation and analysis of problems of information security arising from human-machine interaction and presentation of the Human Centered Security by Design approach.
- Introduction into organizational protective measures and standards to be observed for companies.

Below you will find excerpts from events related to this course:



### Applied Informatics - Information Security

2511550, SS 2024, 2 SWS, [Open in study portal](#)

Lecture (V)  
On-Site

#### Content

- Basics and concepts of information security
- Understanding the protection objectives of information security and various attack models (including associated assumptions)
- introduction of measures to achieve the respective protection goals, taking into account different attack models
- Note: In contrast to the IT Security lecture, measures such as encryption algorithms are treated only abstractly, i. e. the idea of the measure, assumptions to the attacker and the deployment environment.
- Presentation and analysis of problems of information security arising from human-machine interaction and presentation of the Human Centered Security by Design approach.
- Introduction into organisational protective measures and standards to be observed for companies

#### Learning objectives:

The student

- can explain the basics of information security
- knows suitable measures to achieve different protection goals
- can assess the quality of organisational protective measures, i. e. among other things knows what has to be taken into account when using the individual measures
- understands the differences between information security in the organisational and in the private context
- knows the areas of application of different standards and knows their weaknesses
- knows and can explain the problems of information security that which arise from human-machine interaction
- is able to deal with messages concerning found security problems in a critical way.

This course can also be credited for the KASTEL certificate. Further information about obtaining the certificate can be found on the SECUSO website [https://secuso.aifb.kit.edu/Studium\\_und\\_Lehre.php](https://secuso.aifb.kit.edu/Studium_und_Lehre.php)).

#### Literature

- P. Gerber, M. Ghiglieri, B. Henhapl, O. Kulyk, K. Marky, P. Mayer, B. Reinheimer, and M. Volkamer, *Human Factors in Security*. Springer, Jan. 2018, pp. 83–98.
- C. Eckert, *IT-Sicherheit: Konzepte-Verfahren-Protokolle*. Walter de Gruyter, 2013



### Exercise Applied Informatics - Information Security

2511551, SS 2024, 1 SWS, [Open in study portal](#)

Practice (Ü)  
On-Site

#### Content

This course can also be credited for the KASTEL certificate. Further information about obtaining the certificate can be found on the SECUSO website [https://secuso.aifb.kit.edu/Studium\\_und\\_Lehre.php](https://secuso.aifb.kit.edu/Studium_und_Lehre.php)).

## T

## 8.16 Course: Applied Informatics – Modelling [T-WIWI-110338]

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2511030	<a href="#">Applied Informatics - Modelling</a>	2 SWS	Lecture / 🗣️	Schiefer, Schüler
WT 24/25	2511031	<a href="#">Exercises to Applied Informatics - Modelling</a>	1 SWS	Practice / 🗣️	Schiefer, Schüler
Exams					
ST 2024	79AIFB_AI1_B2	<a href="#">Applied Informatics - Modelling (Registration until 15 July 2024)</a>			Oberweis
WT 24/25	79AIFB_AI1_C4	<a href="#">Applied Informatics – Modelling</a>			Oberweis

Legend: 🗣️ Online, 🗣️🗣️ Blended (On-Site/Online), 🗣️ On-Site, ✖ Canceled

### Competence Certificate

The assessment consists of a written examination (60 min) in the first week after lecture period (according to Section 4 (2),1 of the examination regulation).

### Prerequisites

None

Below you will find excerpts from events related to this course:

## V

### Applied Informatics - Modelling

2511030, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

In the context of complex information systems, modelling is of central importance, e.g. – in the context of systems to be developed – for a better understanding of their functionality or in the context of existing systems for supporting maintenance and further development.

Modelling, in particular modelling of information systems, forms the core part of this lecture. The lecture is organized in two parts. The first part mainly covers the modelling of static aspects, the second part covers the modelling of dynamic aspects of information systems.

The lecture sets out with a definition of modelling and the advantages of modelling. After that, advanced aspects of UML, the Entity Relationship model (ER model) and logics as a means of modelling static aspects will be explained. This will be complemented by the relational data model and the systematic design of databases based on ER models. For modelling dynamic aspects, different types of petri-nets together with their respective analysis techniques will be introduced.

### Learning objectives:

Students

- explain the strengths and weaknesses of various modeling approaches for Information Systems and choose an appropriate method for a given problem,
- create UML models, ER models and Petri nets for given problems,
- modelling given situations in propositional and predicate logic and can interpret them,
- analyze various properties in propositional and predicate logic,
- create and evaluate a relational database schema and express queries in relational algebra.

### Workload:

- Total effort: 120-135 hours
- Presence time: 45 hours
- Self study: 75-90 hours

## Literature

- Bernhard Rumpe. Modellierung mit UML, Springer-Verlag, 2004.
- R. Elmasri, S. B. Navathe. Fundamentals of Database Systems. Pearson Education 2009.
- W. Reisig. Petrinetze, Springer-Verlag, 2010.

## Weiterführende Literatur:

- U. Kastens, H. Kleine Büning. Modellierung – Grundlagen und Formale Methoden. Carl Hanser Verlag, 2014
- J.L. Peterson. Petri Net Theory and Modeling of Systems, Prentice Hall, 1981.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag, 2000



## Exercises to Applied Informatics - Modelling

2511031, WS 24/25, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)  
On-Site

## Content

In the context of complex information systems, modelling is of central importance, e.g. – in the context of systems to be developed – for a better understanding of their functionality or in the context of existing systems for supporting maintenance and further development.

Modelling, in particular modelling of information systems, forms the core part of this lecture. The lecture is organized in two parts. The first part mainly covers the modelling of static aspects, the second part covers the modelling of dynamic aspects of information systems.

The lecture sets out with a definition of modelling and the advantages of modelling. After that, advanced aspects of UML, the Entity Relationship model (ER model) and logics as a means of modelling static aspects will be explained. This will be complemented by the relational data model and the systematic design of databases based on ER models. For modelling dynamic aspects, different types of petri-nets together with their respective analysis techniques will be introduced.

## Learning objectives:

### Students

- explain the strengths and weaknesses of various modeling approaches for Information Systems and choose an appropriate method for a given problem,
- create UML models, ER models and Petri nets for given problems,
- modelling given situations in propositional and predicate logic and can interpret them,
- analyze various properties in propositional and predicate logic,
- create and evaluate a relational database schema and express queries in relational algebra.

## Workload:

- Total effort: 120-135 hours
- Presence time: 45 hours
- Self study: 75-90 hours

## Organizational issues

Bei Bedarf wird ein Tutorium online angeboten.

## Literature

- - Bernhard Rumpe. Modellierung mit UML, Springer-Verlag, 2004.
  - R. Elmasri, S. B. Navathe. Fundamentals of Database Systems. Pearson Education 2009.
  - W. Reisig. Petrinetze, Springer-Verlag, 2010.

## Weiterführende Literatur:

- U. Kastens, H. Kleine Büning. Modellierung – Grundlagen und Formale Methoden. Carl Hanser Verlag, 2014
- J.L. Peterson. Petri Net Theory and Modeling of Systems, Prentice Hall, 1981.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag, 2000

T

## 8.17 Course: Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services [T-WIWI-110339]

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2024	2511032	<a href="#">Applied Informatics - Internet Computing</a>	2 SWS	Lecture /	Sunyaev
ST 2024	2511033	<a href="#">Übungen zu Angewandte Informatik - Internet Computing</a>	1 SWS	Practice /	Sunyaev, Rank, Guse
Exams					
ST 2024	79AIFB_AI2_A2	<a href="#">Applied Informatics - Internet Computing (Registration until 21 July 2024)</a>			Sunyaev
WT 24/25	79AIFB_AI-IC_B4	<a href="#">Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services</a>			Sunyaev

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

The assessment consists of a written exam (60 min) according to Section 4(2), 1 of the examination regulation. The successful completion of the exercises is recommended for the written exam, which is offered at the end of the winter semester and at the end of the summer semester.

Successful participation in the exercise by submitting correct solutions to 50% of the exercises can earn a grade bonus. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

### Prerequisites

None

Below you will find excerpts from events related to this course:

V

### Applied Informatics - Internet Computing

2511032, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The lecture Applied Computer Science - Internet Computing provides insights into fundamental concepts and future technologies of distributed systems and Internet computing. Students should be able to select, design and apply the presented concepts and technologies. The course first introduces basic concepts of distributed systems (e.g. design of architectures for distributed systems, internet architectures, web services, middleware).

In the second part of the course, emerging technologies of Internet computing will be examined in depth. These include, among others:

- Cloud Computing
- Edge & Fog Computing
- Internet of Things
- Blockchain
- Artificial Intelligence

**Learning objectives:**

The student learns about basic concepts and emerging technologies of distributed systems and internet computing. Practical topics will be deepened in lab classes.

**Recommendations:**

Knowledge of content of the module [WI1INFO].

**Workload:**

The total workload for this course is approximately 135-150 hours.

**Literature**

Wird in der Vorlesung bekannt gegeben

## T

## 8.18 Course: Applied Informatics – Software Engineering [T-WIWI-110343]

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2024	2511206	<a href="#">Applied Informatics - Software Engineering</a>	2 SWS	Lecture /	Oberweis
ST 2024	2511207	<a href="#">Übungen zu Angewandte Informatik - Software Engineering</a>	1 SWS	Practice /	Oberweis, Forell, Frister, Schüler, Fritsch
Exams					
ST 2024	79AIFB_SE_B3	<a href="#">Applied Informatics - Software Engineering (Registration until 15 July 2024)</a>			Oberweis
WT 24/25	79AIFB_SE_B1	<a href="#">Applied Informatics – Software Engineering</a>			Oberweis

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of an 1h written exam in the first week after lecture period.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-WIWI-100809 - Software Engineering](#) must not have been started.

Below you will find excerpts from events related to this course:

## V

**Applied Informatics - Software Engineering**

2511206, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The course deals with fundamental aspects of the systematic development of huge software systems. The course covers topics such as:

- software developing process models
- methods and tools for the development phases: requirements analysis, system specification, system design, programming and testing.

**Learning objectives:**

Students

- are familiar with the concepts and principles of software engineering and can discuss it,
- know common software development process models and their strengths and weaknesses and can discuss it,
- know methods for requirements analysis and can use it and can model and evaluate use case models,
- know models for systems structuring and controlling as well as architecture principles of software systems and can discuss it.
- can model and evaluate component diagrams
- are familiar with basic concepts of software quality management and are able to apply software test and evaluation methods in concrete situations.

**Workload:**

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

**Literature**

- H. Balzert. Lehrbuch der Software-Technik. Spektrum Verlag 2008.
- I. Sommerville. Software Engineering. Pearson Studium 2012.

Weitere Literatur wird in der Vorlesung bekannt gegeben.




T





**8.19 Course: Artificial Intelligence in Production [T-MACH-112115]**

**Responsible:** Prof. Dr.-Ing. Jürgen Fleischer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	1

Events					
WT 24/25	2149921	<a href="#">Artificial Intelligence in Production</a>	2 SWS	Lecture / 	Fleischer
Exams					
ST 2024	76-T-MACH-112115	<a href="#">Artificial Intelligence in Production</a>			Fleischer
WT 24/25	76-T-MACH-112115	<a href="#">Artificial Intelligence in Production</a>			Fleischer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Written Exam (90 min)

**Prerequisites**

none

Below you will find excerpts from events related to this course:

V

**Artificial Intelligence in Production**

2149921, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The module AI in Production is designed to teach students the practical, holistic integration of machine learning and artificial intelligence methods in production. The course is oriented towards the phases of the CRISP-DM process with the aim of developing a deep understanding of the necessary steps and content-related aspects (methods) within the individual phases. In addition to teaching the practical aspects of integrating the most important machine learning methods, the focus is primarily on the necessary steps for data generation and data preparation as well as the implementation and validation of the methods in an industrial environment.

The lecture "Artificial Intelligence in Production" deals with the theoretical basics in a practical context. Here, the six phases of the CRISP-DM process are run through sequentially and the necessary basics for the implementation of the respective phases are taught. The course first deals with the data sources that are prevalent in the production environment. Subsequently, possibilities for target-oriented data acquisition as well as data transfer and data storage are introduced. Possibilities for data filtering and data preprocessing are discussed and production-relevant aspects are pointed out. The course then covers in detail the necessary algorithms and procedures for implementing AI in production, before techniques and fundamentals for making the models permanent in production (deployment) are discussed.

**Learning Outcomes:**

The students

- understand the relevance for the application of AI in production and know the main drivers and challenges.
- will understand the CRISP-DM process for implementing AI projects in manufacturing. Students will be able to name the main data sources, data ingestion methods, communication architectures, models and methods for data processing.
- will understand the main machine learning techniques and be able to contrast and select them in the context of industrial issues.
- are able to assess whether a specific problem in the context of production can be solved in a target-oriented manner using machine learning methods, as well as what the necessary steps are for implementation.
- are able to assess the most important challenges and name possible approaches to solve them.
- are able to apply the phases of the CRISP-DM to a problem in production. Students will know the steps necessary to build a data pipeline and will be able to do so theoretically in the context of a real-world use case.
- are able to evaluate the results of common deep learning methods and, based on this, to theoretically elaborate and theoretically apply proposed solutions (from the field of machine learning).

**Workload:****MACH:**

regular attendance: 31,5 hours

self-study: 88,5 hours

**WING:**

regular attendance: 31,5 hours

self-study: 118,5 hours

**Organizational issues**

Vorlesungstermine freitags 14:00 Uhr, begleitet durch Online-Programmierübungen.

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (<https://www.karlsruher-forschungsfabrik.de>) unterstützt.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (<https://www.karlsruher-forschungsfabrik.de/en.html>) to deepen the acquired knowledge.

**Literature**

Skript zur Veranstaltung wird über Ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

## T

## 8.20 Course: Auction &amp; Mechanism Design [T-WIWI-102876]

**Responsible:** Prof. Dr. Nora Szech  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-101501 - Economic Theory](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2024	2560550	<a href="#">Digitale Märkte und Mechanismen</a>	2 SWS	Lecture / 🗣️	Rosar
ST 2024	2560551	<a href="#">Übung zu Digitale Märkte und Mechanismen</a>	1 SWS	Practice / 🗣️	Rosar
Exams					
ST 2024	7900161	<a href="#">Exam Digitale Märkte und Mechanismen</a>			Puppe
WT 24/25	7900007	<a href="#">Exam Digitale Märkte und Mechanismen (2)</a>			Puppe

Legend: 🗣️ Online, 🗣️🗣️ Blended (On-Site/Online), 🗣️ On-Site, ✕ Cancelled

### Competence Certificate

The assessment consists of a written exam (60 minutes) (following S4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

A bonus can be earned through successful participation in the exercise. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

### Prerequisites

None

### Recommendation

Basic knowledge of microeconomics and statistics are recommended. A background in game theory is helpful, but not absolutely necessary.

### Annotation

The lecture will be held in English.

Below you will find excerpts from events related to this course:

## V

### Digitale Märkte und Mechanismen

2560550, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

Many businesses in the digital economy monetize through auctions. For example, every time you use Google, an auction is held in the background. This course develops the basic theory of **auctions** and **mechanism design** that is necessary for gaining a deeper understanding of many markets in the digital economy.

The course starts with the basic theory of equilibrium behavior and revenue management in single-object standard auctions. The revenue equivalence theorem for standard auctions is introduced. Thereafter, the course focuses on mechanism design and its applications to single-object auctions and bilateral trade.

The students

- learn to analyze strategic behavior in auctions;
- learn to compare auction formats with regard to efficiency and revenue;
- are familiarized with the basic theory of (Bayesian) mechanism design;
- learn to master the revenue equivalence theorem for standard auctions;
- learn to apply mechanism design to one object auctions and bilateral trade.

The assessment consists of a written exam (60 minutes).

The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Through successful participation in the Exercise, students can earn a bonus. If the grade on the written exam is between 4,0 and 1,3 the bonus improves the grade by one step (0,3 or 0,4). Details will be announced during the lecture.

The total workload for this course is approximately 135.0 hours. For further information see German version.

**Recommendations:**

Basic knowledge of microeconomics and statistics are recommended. A background in game theory is helpful, but not absolutely necessary.

**Literature**

Krishna, V.: Auction Theory, Academic Press, 2009.

Milgrom, P.: Putting Auction Theory to Work, Cambridge University Press, 2010.

Mathews, S.: A Technical Primer on Auction Theory I: Independent Private Values No. 1096. Northwestern University, Center for Mathematical Studies in Economics and Management Science, 1995.

**8.21 Course: Automotive Engineering I [T-MACH-102203]**

**Responsible:** Prof. Dr. Frank Gauterin  
Dr.-Ing. Martin Gießler

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101266 - Automotive Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	1

Events					
WT 24/25	2113809	<a href="#">Automotive Engineering I</a>	4 SWS	Lecture /	Gießler
Exams					
ST 2024	76-T-MACH-102203	<a href="#">Automotive Engineering I</a>			Gauterin
WT 24/25	76-T-MACH-102203	<a href="#">Automotive Engineering I</a>			Gießler

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Written examination

Duration: 120 minutes

Auxiliary means: none

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-MACH-100092 - Automotive Engineering I](#) must not have been started.

Below you will find excerpts from events related to this course:

**Automotive Engineering I**

2113809, WS 24/25, 4 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

1. History and future of the automobile
2. Driving mechanics: driving resistances and driving performances, mechanics of longitudinal and lateral forces, active and passive safety
3. Drive systems: combustion engine, hybrid and electric drive systems
4. Transmission: clutches (e.g. friction clutch, visco clutch), transmission (e.g. mechanical transmission, hydraulic fluid transmission)
5. Power transmission and distribution: drive shafts, cardon joints, differentials

Learning Objectives:

The students know the movements and the forces at the vehicle and are familiar with active and passive safety. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyze, to evaluate, and to develop the complex system "vehicle".

**Organizational issues**

You will find the lecture material on ILIAS. To get the ILIAS password, KIT students refer to <https://fast-web-01.fast.kit.edu/PasswoerterIlias/>, students from eucor universities send an e-mail to [martina.kaiser@kit.edu](mailto:martina.kaiser@kit.edu)

Kann nicht mit LV Grundlagen der Fahrzeugtechnik I [2113805] kombiniert werden.

Can not be combined with lecture [2113805] Grundlagen der Fahrzeugtechnik I.

**Literature**

1. Robert Bosch GmbH: Automotive Handbook, 9th Edition, Wiley, Chichister 2015
2. Onori, S. / Serrao, L. / Rizzoni, G.: Hybrid Electric Vehicles - Energy Management Strategies, Springer London, Heidelberg, New York, Dordrecht 2016
3. Reif, K.: Brakes, Brake Control and Driver Assistance Systems - Function, Regulation and Components, Springer Vieweg, Wiesbaden 2015
4. Gauterin, F. / Gießler, M. / Gnadler, R.: Scriptum zur Vorlesung 'Automotive Engineering I', KIT, Institut für Fahrzeugsystemtechnik, Karlsruhe, jährlich aktualisiert

## T

## 8.22 Course: Automotive Engineering I [T-MACH-100092]

**Responsible:** Prof. Dr. Frank Gauterin  
Dr.-Ing. Martin Gießler

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101266 - Automotive Engineering](#)

Type	Credits	Grading scale	Recurrence	Expansion	Language	Version
Written examination	6	Grade to a third	Each winter term	1 terms		3

Events						
WT 24/25	2113805	<a href="#">Automotive Engineering I</a>	4 SWS	Lecture / 🗣️	Gießler	
WT 24/25	2113809	<a href="#">Automotive Engineering I</a>	4 SWS	Lecture / 🗣️	Gießler	
Exams						
ST 2024	76-T-MACH-100092	<a href="#">Automotive Engineering</a>				Gauterin, Gießler
WT 24/25	76-T-MACH-100092	<a href="#">Automotive Engineering</a>				Gießler

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✕ Cancelled

### Competence Certificate

Written examination

Duration: 120 minutes

Auxiliary means: none

### Prerequisites

The brick "T-MACH-102203 - Automotive Engineering I" is not started or finished. The bricks "T-MACH-100092 - Grundlagen der Fahrzeugtechnik I" and "T-MACH-102203 - Automotive Engineering I" can not be combined.

Below you will find excerpts from events related to this course:

## V

## Automotive Engineering I

2113805, WS 24/25, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

1. History and future of the automobile
2. Driving mechanics: driving resistances and driving performance, mechanics of longitudinal and lateral forces, active and passive safety
3. Drive systems: combustion engine, hybrid and electric drive systems
4. Transmission: clutches (e.g. friction clutch, visco clutch), transmission (e.g. mechanical transmission, hydraulic fluid transmission)
5. Power transmission and distribution: drive shafts, cardon joints, differentials

### Learning Objectives:

The students know the movements and the forces at the vehicle and are familiar with active and passive safety. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyze, to evaluate, and to develop the complex system "vehicle".

### Organizational issues

Das Vorlesungsmaterial wird auf ILIAS bereitgestellt. Das ILIAS-Passwort erhalten Sie unter <https://fast-web-01.fast.kit.edu/Passwoerterllias/>

Kann nicht mit der Veranstaltung [2113809] kombiniert werden.

Can not be combined with lecture [2113809].

**Literature**

1. Mitschke, M. / Wallentowitz, H.: Dynamik der Kraftfahrzeuge, Springer Vieweg, Wiesbaden 2014
2. Pischinger, S. / Seiffert, U.: Handbuch Kraftfahrzeugtechnik, Springer Vieweg, Wiesbaden 2016
3. Gauterin, F. / Unrau, H.-J. / Gnadler, R.: Scriptum zur Vorlesung "Grundlagen der Fahrzeugtechnik I", KIT, Institut für Fahrzeugsystemtechnik, Karlsruhe, jährlich aktualisiert

**Automotive Engineering I**2113809, WS 24/25, 4 SWS, Language: English, [Open in study portal](#)**Lecture (V)  
On-Site****Content**

1. History and future of the automobile
2. Driving mechanics: driving resistances and driving performances, mechanics of longitudinal and lateral forces, active and passive safety
3. Drive systems: combustion engine, hybrid and electric drive systems
4. Transmission: clutches (e.g. friction clutch, visco clutch), transmission (e.g. mechanical transmission, hydraulic fluid transmission)
5. Power transmission and distribution: drive shafts, cardon joints, differentials

**Learning Objectives:**

The students know the movements and the forces at the vehicle and are familiar with active and passive safety. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyze, to evaluate, and to develop the complex system "vehicle".

**Organizational issues**

You will find the lecture material on ILIAS. To get the ILIAS password, KIT students refer to <https://fast-web-01.fast.kit.edu/Passwoerterllias/>, students from eucor universities send an e-mail to [martina.kaiser@kit.edu](mailto:martina.kaiser@kit.edu)

Kann nicht mit LV Grundlagen der Fahrzeugtechnik I [2113805] kombiniert werden.

Can not be combined with lecture [2113805] Grundlagen der Fahrzeugtechnik I.

**Literature**

1. Robert Bosch GmbH: Automotive Handbook, 9th Edition, Wiley, Chichister 2015
2. Onori, S. / Serrao, L. / Rizzoni, G.: Hybrid Electric Vehicles - Energy Management Strategies, Springer London, Heidelberg, New York, Dordrecht 2016
3. Reif, K.: Brakes, Brake Control and Driver Assistance Systems - Function, Regulation and Components, Springer Vieweg, Wiesbaden 2015
4. Gauterin, F. / Gießler, M. / Gnadler, R.: Scriptum zur Vorlesung 'Automotive Engineering I', KIT, Institut für Fahrzeugsystemtechnik, Karlsruhe, jährlich aktualisiert



## T

## 8.23 Course: Automotive Engineering II [T-MACH-102117]

**Responsible:** Prof. Dr. Frank Gauterin  
Dr.-Ing. Martin Gießler

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101266 - Automotive Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each summer term	1

Events					
ST 2024	2114835	<a href="#">Automotive Engineering II</a>	2 SWS	Lecture /	Gießler
ST 2024	2114855	<a href="#">Automotive Engineering II</a>	2 SWS	Lecture /	Gießler
Exams					
ST 2024	76-T-MACH-102117	<a href="#">Automotive Engineering II</a>			Gauterin, Gießler
ST 2024	76T-MACH-102117_mdI.	<a href="#">Automotive Engineering II</a>			Gießler
WT 24/25	76-T-MACH-102117	<a href="#">Automotive Engineering II</a>			Gießler
WT 24/25	76T-MACH-102117-2	<a href="#">Automotive Engineering II</a>			Gießler

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

Written Examination

Duration: 90 minutes

Auxiliary means: none

**Prerequisites**  
none

Below you will find excerpts from events related to this course:

## V

## Automotive Engineering II

2114835, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

1. Chassis: Wheel suspensions (rear axles, front axles, kinematics of axles), tyres, springs, damping devices
2. Steering elements: Manual steering, servo steering, steer by wire
3. Brakes: Disc brake, drum brake, comparison of designs

Learning Objectives:

The students have an overview of the modules which are necessary for the tracking of a motor vehicle and the power transmission between vehicle bodywork and roadway. They have knowledge of different wheel suspensions, tyres, steering elements, and brakes. They know different design versions, functions and the influence on driving and braking behavior. They are able to correctly develop the appropriate components. They are ready to analyze, to evaluate, and to optimize the complex interaction of the different components under consideration of boundary conditions.

### Organizational issues

Kann nicht mit der Veranstaltung [2114855] kombiniert werden.

Can not be combined with lecture [2114855]

**Literature**

1. Heiing, B. / Ersoy, M.: Fahrwerkhandbuch: Grundlagen, Fahrdynamik, Komponenten, Systeme, Mechatronik, Perspektiven, Springer Vieweg, Wiesbaden, 2013
2. Breuer, B. / Bill, K.-H.: Bremsenhandbuch: Grundlagen - Komponenten - Systeme - Fahrdynamik, Springer Vieweg, Wiesbaden, 2017
3. Unrau, H.-J. / Gnadler, R.: Scriptum zur Vorlesung 'Grundlagen der Fahrzeugtechnik II', KIT, Institut fr Fahrzeugsystemtechnik, Karlsruhe, jhrliche Aktualisierung

**Automotive Engineering II**2114855, SS 2024, 2 SWS, Language: English, [Open in study portal](#)**Lecture (V)  
On-Site****Content**

1. Chassis: Wheel suspensions (rear axles, front axles, kinematics of axles), tyres, springs, damping devices
2. Steering elements: Manual steering, servo steering, steer by wire
3. Brakes: Disc brake, drum brake, comparison of the designs

**Learning Objectives:**

The students have an overview of the modules which are necessary for the tracking of a motor vehicle and the power transmission between vehicle and roadway. They have knowledge of different wheel suspensions, tyres, steering elements, and brakes. They know different design versions, functions and the influence on driving and braking behavior. They are able to correctly develop the appropriate components. They are ready to analyze, to evaluate, and to optimize the complex interaction of the different components under consideration of boundary conditions.

**Literature****Elective literature:**



1. Robert Bosch GmbH: Automotive Handbook, 9th Edition, Wiley, Chichester 2015
2. Heiing, B. / Ersoy, M.: Chassis Handbook - fundamentals, driving dynamics, components, mechatronics, perspectives, Vieweg+Teubner, Wiesbaden 2011
3. Gieler, M. / Gnadler, R.: Script to the lecture "Automotive Engineering II", KIT, Institut of Vehicle System Technology, Karlsruhe, annual update


T

## 8.24 Course: B2B Sales Management [T-WIWI-111367]

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101424 - Foundations of Marketing](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2572187	<a href="#">B2B Sales Management</a>	2 SWS	Lecture / 	Klarmann
WT 24/25	2572188	<a href="#">Excercises B2B Sales Management</a>	1 SWS	Practice / 	Gerlach, Daumann
Exams					
ST 2024	7900021	<a href="#">B2B Sales Management</a>			Klarmann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment of success takes place through the preparation and presentation of a sales presentation based on a case study (max 30 points) and a written exam with additional aids in the sense of an open book exam (max. 60 points). In total, a maximum of 90 points can be achieved in the course. Further details will be announced during the lecture.

**Prerequisites**

None.

**Annotation**

For further information, please contact Marketing and Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

Below you will find excerpts from events related to this course:

V

**B2B Sales Management**

2572187, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content****Content**

The event is designed to teach you taking on marketing responsibility in a very special business environment. This involves companies that sell and market their (often technically highly complex) products themselves to other companies, which is referred to as "business-to-business" (B2B) marketing and sales. Since traditional communication instruments (e.g. advertising) often hardly work in this environment and many projects lead to a long-term cooperation between supplier and customer, (personal) sales play a special role in marketing. Therefore, this event introduces marketing in B2B markets on the one hand and deals with questions of sales and distribution on the other hand.

Topics with regard to B2B sales management are:

- Basic aspects of B2B sales and B2B purchasing
- Understanding of marketing challenges in specific B2B business types (commodities, systems, solutions)
- Value pricing and value-based selling
- Organizational buying behavior
- Basics of B2B customer relationship management (e.g. key account management, reference customer management)
- Sales process (lead generation, sales presentations, customer-oriented selling, closing)
- Sales automation

**Learning objectives**

Students

- Are familiar with marketing and sales peculiarities and challenges in B2B environments
- Are able to identify different B2B business types and their marketing characteristics
- Are familiar with central theories of organizational buying behavior
- Are familiar with central objectives of Customer Relationship Management in B2B environments and are able to implement them with appropriate tools
- Are able to prioritize customers and calculate B2B Customer Lifetime Value
- Know how B2B sales presentations work and have also gained practical experience in this area
- Are able to determine value-based prices

**Workload**

The total workload for this course is approximately 135.0 hours.

Attendance time: 35.0 hours

Self-study: 100.0 hours

**Organization**

A detailed schedule will be announced.

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

T

**8.25 Course: Bachelor's Thesis [T-WIWI-103067]**

**Responsible:** Studiendekan des KIT-Studienganges  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101601 - Module Bachelor's Thesis](#)

Type	Credits	Grading scale	Version
Final Thesis	12	Grade to a third	1

**Competence Certificate**

see module description

**Prerequisites**

see module description

**Final Thesis**

This course represents a final thesis. The following periods have been supplied:

<b>Submission deadline</b>	6 months
<b>Maximum extension period</b>	1 months
<b>Correction period</b>	6 weeks

## T

## 8.26 Course: Basic Principles of Economic Policy [T-WIWI-103213]

**Responsible:** Prof. Dr. Ingrid Ott  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101668 - Economic Policy I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	see Annotations	1

Events					
ST 2024	2560280	<a href="#">Basic Principles of Economic Policy</a>	2 SWS	Lecture / ✕	Ott
ST 2024	2560281	<a href="#">Exercises of Basic Principles of Economic Policy</a>	1 SWS	Practice / ●	Scheidt, Zoroglu
Exams					
ST 2024	7900106	<a href="#">Basic Principles of Economic Policy</a>			Ott
WT 24/25	7900079	<a href="#">Basic Principles of Economic Policy</a>			Ott

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

Depending on further pandemic developments, the examination will be offered either as a 60-minute written examination (written examination according to SPO § 4 Abs. 2, Pkt. 1) or as an open-book examination (alternative exam assessment according to SPO § 4 Abs. 2, Pkt. 3).

### Prerequisites

None

### Recommendation

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2610012], and Economics II [2600014].

**Annotation**

Please note that the lecture will not be held in summer semester 2021. The exam is offered.

**Description:**

Theory of general economic policy and discussion of current economic policy topics:

- Goals of economic policy,
- Instruments and institutions of economic policy,
- Triad of regional, national and European economic policies,
- special fields of economic policy, in particular growth, employment, provision of public infrastructure and climate policy.

**Learning objectives:**

Students learn:

- To apply basic concepts of micro- and macroeconomic theories to economic policy issues.
- to develop arguments on how state intervention in the market can be legitimized from a welfare economic perspective
- to derive theory-based policy recommendations.

**Learning content:**

- Market interventions: microeconomic perspective
- Market interventions: macroeconomic perspective
- Institutional economic aspects
- Economic policy and welfare economics
- Economic policy makers: Political-economic aspects

**Workload:**

- Total effort at 4.5 LP: approx. 135 hours
- Presence time: approx. 30 hours
- Self-study: approx. 105 hours

**Media:**

See course announcement

**References:**

See course announcement

*Below you will find excerpts from events related to this course:*

**Basic Principles of Economic Policy**

2560280, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
Cancelled

**Content**

The lecture deals with theories of general economic policy and discussion of current economic policy topics:

- Goals of economic policy,
- Instruments and institutions of economic policy,
- Triad of regional, national and European economic policies,
- special fields of economic policy, in particular growth, employment, provision of public infrastructure and climate policy.

**Learning objectives:**

Students shall be given the ability to

- apply basic concepts of micro- and macroeconomic theories to economic policy issues
- develop arguments on how state intervention in the market can be legitimized from a welfare economic perspective
- derive theory-based policy recommendations

**Recommendations:**

Basic micro- and macroeconomic knowledge is required, especially as taught in the courses Economics I [2610012] and Economics II [2600014].

**Workload:**

Total effort at 4.5 LP is approx. 135 hours and consists of:

- Presence time: approx. 30 hours
- Self-study: approx. 105 hours

**Assessment:**

The examination takes place in the form of a written examination (60min) (according to §4(2), 1 SPO). The examination is offered every semester and can be repeated at any regular examination date.

**Organizational issues**

Zugehörige Veranstaltung: Übungen zur Einführung in die Wirtschaftspolitik [2560281]

Die Vorlesung wird im SoSe 2024 nicht gelesen. Die Prüfung findet statt. Vorbereitungsunterlagen finden Sie im Ilias.

**Literature**

- Klump, Rainer (2013): Wirtschaftspolitik. Pearson Studium
- Baldwin, Richard und Charles Wyplosz (2019): The Economics of European Integration, 6. Edition, McGraw-Hill Education, London
- Foliensatz zur Vorlesung
- Übungsaufgaben

**Exercises of Basic Principles of Economic Policy**

2560281, SS 2024, 1 SWS, Language: German, [Open in study portal](#)

**Practice (Ü)  
On-Site**

**Organizational issues**

Zugehörige Veranstaltung: [2560280] Einführung in die Wirtschaftspolitik

**Literature**

- Klump, Rainer (2013): Wirtschaftspolitik. Pearson Studium
- Baldwin, Richard und Charles Wyplosz (2019): The Economics of European Integration, 6. Edition, McGraw-Hill Education, London
- Foliensatz zur Vorlesung
- Übungsaufgaben



## T


## 8.27 Course: Basics of German Company Tax Law and Tax Planning [T-WIWI-108711]





**Responsible:** Dr. Gerd Gutekunst  
Prof. Dr. Berthold Wigger

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-101403 - Public Finance](#)  
[M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2560134	<a href="#">Basics of German Company Tax Law and Tax Planning</a>	3 SWS	Lecture / 	Wigger, Gutekunst
Exams					
ST 2024	790unbe	<a href="#">Basics of German Company Tax Law and Tax Planning</a>			Wigger
WT 24/25	790unbe	<a href="#">Basics of German Company Tax Law and Tax Planning</a>			Wigger

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Depending on the further pandemic development the assessment will consist either of an open book exam (following Art. 4, para. 2, clause 3 of the examination regulation), or of an 1.5 h written exam (following Art. 4, para. 2, clause 1 of the examination regulation).

**Prerequisites**

None

**Recommendation**

Knowledge of the collection of public revenues is assumed. Therefore it is recommended to attend the course "Öffentliche Einnahmen" beforehand.

Below you will find excerpts from events related to this course:

## V

**Basics of German Company Tax Law and Tax Planning**

2560134, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content****Workload:**

The total workload for this course is approximately 135.0 hours. For further information see German version.

## T

## 8.28 Course: Basics of Technical Logistics I [T-MACH-109919]

**Responsible:** Dr.-Ing. Martin Mittwollen  
Dr.-Ing. Jan Oellerich

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101279 - Technical Logistics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each winter term	2

Events					
WT 24/25	2117095	<a href="#">Basics of Technical Logistics I</a>	4 SWS	Lecture / Practice (/)	Mittwollen
Exams					
ST 2024	76-T-MACH-109919	<a href="#">Basics of Technical Logistics I</a>			Mittwollen
ST 2024	76-T-MACH-109919-mPr	<a href="#">Basics of Technical Logistics I</a>			Mittwollen

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

### Prerequisites

none

### Recommendation

Knowledge of the basics of technical mechanics preconditioned.

Below you will find excerpts from events related to this course:

## V

### Basics of Technical Logistics I

2117095, WS 24/25, 4 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)  
On-Site

### Content

- effect model of conveyor machines
- elements for the change of position and orientation
- conveyor processes
- identification systems
- drives
- mechanical behaviour of conveyors
- structure and function of conveyor machines
- elements of intralogistics
- sample applications and calculations in addition to the lectures inside practical lectures

Students are able to:

- Describe processes and machines of technical logistics,
- Model the fundamental structures and the impacts of material handling machines with mathematical models,
- Refer to industrially used machines
- Model real machines applying knowledge from lessons and calculate their dimensions.

**Organizational issues**

Die Erfolgskontrolle erfolgt in Form einer schriftlichen oder mündlichen Prüfung (nach §4 (2), 1 bzw. 2SPO).

The assessment consists of a written or oral exam according to Section 4 (2), 1 or 2 of the examination regulation.

Es wird Kenntnis der Grundlagen der Technischen Mechanik vorausgesetzt.

Basics knowledge of technical mechanics is preconditioned.

Ergänzungsblätter, Präsentationen, Tafel.

Supplementary sheets, presentations, blackboard.

Präsenz: 48Std

Nacharbeit: 132Std

presence: 48h

rework: 132h

**Literature**

Empfehlungen in der Vorlesung / Recommendations during lessons

## T


## 8.29 Course: Basics of Technical Logistics II [T-MACH-109920]





**Responsible:** Prof. Dr.-Ing. Kai Furmans

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101279 - Technical Logistics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	2

Events					
WT 24/25	2117098	<a href="#">Basics of Technical Logistics II</a>	3 SWS	Lecture / Practice (/  )	Mittwollen
Exams					
ST 2024	76-T-MACH-109920	<a href="#">Basics of Technical Logistics II</a>			Oellerich, Mittwollen
ST 2024	76-T-MACH-109920-mPr	<a href="#">Basics of Technical Logistics II</a>			Mittwollen, Oellerich

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

### Prerequisites

none

### Recommendation

Knowledge of the basics of technical mechanics and out of "Basic of Technical Logistics I" (T-MACH-109919) preconditioned.

T


## 8.30 Course: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II [T-MACH-100967]




**Responsible:** Prof. Dr. Andreas Guber

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each summer term	2

Events					
ST 2024	2142883	<a href="#">BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II</a>	2 SWS	Lecture / 	Guber, Ahrens
Exams					
ST 2024	76-T-MACH-100967	<a href="#">BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II</a>			Guber

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Written exam (75 Min.)

### Prerequisites

none

Below you will find excerpts from events related to this course:

V

### BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II

2142883, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

Examples of use in Life-Sciences and biomedicine: Microfluidic Systems:

LabCD, Protein Crystallisation

Microarrays

Tissue Engineering

Cell Chip Systems

Drug Delivery Systems

Micro reaction technology

Microfluidic Cells for FTIR-Spectroscopy

Microsystem Technology for Anesthesia, Intensive Care and Infusion

Analysis Systems of Person's Breath

Neurobionics and Neuroprosthesis

Nano Surgery

### Organizational issues

Zu jedem Vorlesungstermin werden via ILIAS die jeweiligen Folien im PDF-Format zur Verfügung gestellt.

schriftl. Prüfung: Mo, 09.09.2024, 8 - 10 Uhr; 10.21 Carl-Benz-Hörsaal

### Literature

Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

Buess, G.: Operationslehre in der endoskopischen Chirurgie, Band I und II;

Springer-Verlag, 1994

M. Madou

Fundamentals of Microfabrication

**T** **8.31 Course: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III [T-MACH-100968]**

**Responsible:** Prof. Dr. Andreas Guber  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each summer term	2

Events					
ST 2024	2142879	<a href="#">BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III</a>	2 SWS	Lecture /	Guber, Ahrens
Exams					
ST 2024	76-T-MACH-100968	<a href="#">BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III</a>			Guber

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Written exam (75 Min.)

**Prerequisites**

none

*Below you will find excerpts from events related to this course:*

**V** **BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III** **Lecture (V)**  
**On-Site**  
 2142879, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

**Content**

Examples of use in minimally invasive therapy  
 Minimally invasive surgery (MIS)  
 Endoscopic neurosurgery  
 Interventional cardiology  
 NOTES  
 OP-robots and Endosystems  
 License of Medical Products and Quality Management

**Organizational issues**

Zu jedem Vorlesungstermin werden via ILIAS die jeweiligen Folien im PDF-Format zur Verfügung gestellt.  
 schriftl. Prüfung: Mo, 23.09.2024, 10:30 - 12:30 Uhr; 30.21 Christian-Gerthsen-Hörsaal

**Literature**

Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005  
 Buess, G.: Operationslehre in der endoskopischen Chirurgie, Band I und II; Springer-Verlag, 1994  
 M. Madou  
 Fundamentals of Microfabrication

T


**8.32 Course: Boosting of Combustion Engines [T-MACH-105649]**

**Responsible:** Dr.-Ing. Johannes Kech  
Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	1

Events					
ST 2024	2134153	<a href="#">Boosting of Combustion Engines</a>	2 SWS	/ 	Kech
Exams					
ST 2024	76-T-MACH-105649	<a href="#">Boosting of Combustion Engines</a>			Koch

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

oral exam, 20 min

**Prerequisites**

none

## T

## 8.33 Course: Brand Management [T-WIWI-112156]

**Responsible:** Prof. Dr. Ann-Kristin Kupfer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101424 - Foundations of Marketing](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2572190	<a href="#">Brand Management</a>	2 SWS	Lecture / 🗎	Kupfer
WT 24/25	2572191	<a href="#">Brand Management Exercise</a>	1 SWS	Practice / 🗎	Mitarbeiter
Exams					
ST 2024	7900047	<a href="#">Brand Management</a>			Kupfer

Legend: 🗎 Online, 🗎 Blended (On-Site/Online), 🗎 On-Site, ✕ Cancelled

### Competence Certificate

The assessment of success will be done by the preparation and presentation of a case study as well as a written exam. Further details will be announced during the lecture.

### Prerequisites

None

### Recommendation

Students are highly encouraged to actively participate in class.

Below you will find excerpts from events related to this course:

## V

### Brand Management

2572190, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

Students learn the theoretical foundations of brand management and its most important concepts. They learn both about the importance of brands for consumers as well as the importance of brands for firms. Special emphasis will be given to the development of brand strategies. Furthermore, students will learn how to evaluate and apply brand instruments. A tutorial offers the opportunity to apply the key learnings of the lecture using case studies.

The learning objectives are as follows:

- Getting to know the theoretical foundations of brand management
- Evaluating strategic branding options (e.g., relating to the development of the core of the brand and the brand architecture) and operative brand instruments (e.g., relating to the brand name and logo)
- Fostering critical and analytical thinking skills and the application of knowledge to marketing problems
- Improving English skills

Total time required for 4.5 credit points: approx. 135 hours

Attendance time: 30 hours

Self-study: 105 hours



T

**8.34 Course: Business Strategies of Banks [T-WIWI-102626]**

**Responsible:** Prof. Dr. Wolfgang Müller  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	see Annotations	1

**Competence Certificate**

The lecture will be offered for the last time in the winter semester 2021/22. The exam will take place for the last time in the summer semester 2022 (only for repeaters).

**Prerequisites**

None

**Recommendation**

None

**Annotation**



The lecture will be offered for the last time in the winter semester 2021/22.





**T 8.35 Course: CAD-NX Training Course [T-MACH-102187]**

**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework (practical)	2	pass/fail	Each term	2

Events					
ST 2024	2123357	<a href="#">CAD-NX training course</a>	2 SWS	Practical course / 	Rönnau, Mitarbeiter
WT 24/25	2123357	<a href="#">CAD-NX training course</a>	2 SWS	Practical course / 	Rönnau, Mitarbeiter
Exams					
ST 2024	76-T-MACH-102187	<a href="#">CAD-NX Training Course</a>			Rönnau

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Practical verification as academic achievement by working on a design task on the CAD computer, duration: 60 min.

**Prerequisites**

None

**Recommendation**

Dealing with technical drawings is required.

**Annotation**

For the practical course compulsory attendance exists.

Below you will find excerpts from events related to this course:

V

**CAD-NX training course**  
 2123357, SS 2024, 2 SWS, Language: German/English, [Open in study portal](#)

**Practical course (P)**  
**Blended (On-Site/Online)**

**Content**

- Overview of the functional range
- Introduction to the work environment of NX
- Basics of 3D-CAD modelling
- Feature-based modelling
- Freeform modelling
- Generation of technical drawings
- Assembly modelling
- Finite element method (FEM) and multi-body simulation (MBS) with NX

Students are able to:

- create their own 3D geometric models in the CAD system NX and generate drawings due to the created geometry
- carry out FE-studies and kinematic simulations using the integrated CAE tools
- use advanced, knowledge-based functionalities of NX to automate the creation of geometry and thus to ensure the reusability of the models.

**Organizational issues**

Informationen zum Ablauf des Praktikums werden in einer Auftaktveranstaltung veröffentlicht. Hinweise hierzu siehe ILIAS.

**Literature**

Praktikumsskript

**CAD-NX training course**2123357, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)**Practical course (P)  
Blended (On-Site/Online)****Content**

- Overview of the functional range
- Introduction to the work environment of NX
- Basics of 3D-CAD modelling
- Feature-based modelling
- Freeform modelling
- Generation of technical drawings
- Assembly modelling
- Finite element method (FEM) and multi-body simulation (MBS) with NX

Students are able to:

- create their own 3D geometric models in the CAD system NX and generate drawings due to the created geometry
- carry out FE-studies and kinematic simulations using the integrated CAE tools
- use advanced, knowledge-based functionalities of NX to automate the creation of geometry and thus to ensure the reusability of the models.

**Organizational issues**

Das Praktikum kann entweder vorlesungsbegleitend oder als einwöchige Blockveranstaltung in der vorlesungsfreien Zeit absolviert werden. Weitere Informationen siehe ILIAS.

**Literature**

Praktikumsskript

T

## 8.36 Course: Civil Law for Beginners [T-INFO-103339]

**Responsible:** Dr. Yvonne Matz  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-105084 - Public and Civil Law](#)


**Type**  
Written examination

**Credits**  
5

**Grading scale**  
Grade to a third

**Recurrence**  
Each winter term

**Version**  
3

Events					
WT 24/25	24012	<a href="#">Civil Law for Beginners</a>	4 SWS	Lecture / 	Matz
Exams					
ST 2024	7500041	<a href="#">Civil Law for Beginners</a>			Matz
WT 24/25	7500012	<a href="#">Civil Law for Beginners</a>			Matz



Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled





T

## 8.37 Course: Climatology [T-PHYS-101092]

**Responsible:** Prof. Dr. Joaquim José Ginete Werner Pinto  
**Organisation:** KIT Department of Physics  
**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1	pass/fail	Each summer term	4

Events					
ST 2024	4051111	<a href="#">Klimatologie</a>	3 SWS	Lecture / 	Ginete Werner Pinto
ST 2024	4051112	<a href="#">Übungen zu Klimatologie</a>	1 SWS	Practice / 	Ludwig, Stadelmaier, Mömken, Ginete Werner Pinto
Exams					
ST 2024	7800005	<a href="#">Climatology</a>			Ginete Werner Pinto

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled


**Prerequisites**





none

T

**8.38 Course: CO<sub>2</sub>-Neutral Combustion Engines and their Fuels I [T-MACH-111550]****Responsible:** Prof. Dr. Thomas Koch**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101275 - Combustion Engines I](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	5	Grade to a third	Each winter term	1 terms	1

Events					
WT 24/25	2133113	<a href="#">CO<sub>2</sub>-neutral combustion engines and their fuels I</a>	4 SWS	Lecture / Practice (/  )	Koch
Exams					
ST 2024	76-T-MACH-102194	<a href="#">CO<sub>2</sub>-neutral combustion engines and their fuels I</a>			Koch, Kubach

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

oral examination, Duration: 25 min., no auxiliary means

**Prerequisites**

none

*Below you will find excerpts from events related to this course:*

V

**CO<sub>2</sub>-neutral combustion engines and their fuels I**2133113, WS 24/25, 4 SWS, Language: German, [Open in study portal](#)Lecture / Practice (VÜ)  
On-Site**Content**

Introduction, Presentation of IFKM

Working Principle

Characteristic Parameters

Engine Parts

Drive Train

Fuels

Gasoline Engines

Diesel Engines

Hydrogen Engines

Exhaust Gas Emissions

**Organizational issues**

Übungstermine Donnerstags nach Bekanntgabe in der Vorlesung

T

8.39 Course: CO<sub>2</sub>-Neutral Combustion Engines and their Fuels II [T-MACH-111560]

**Responsible:** Prof. Dr. Thomas Koch  
**Organisation:** KIT Department of Mechanical Engineering  
**Part of:** [M-MACH-101303 - Combustion Engines II](#)

**Type**  
Oral examination

**Credits**  
5

**Grading scale**  
Grade to a third

**Recurrence**  
Each summer term

**Version**  
1

Events					
ST 2024	2134151	<a href="#">CO<sub>2</sub>-neutral combustion engines and their fuels II</a>	3 SWS	Lecture / Practice (/)	Koch
Exams					
ST 2024	76-T-MACH-104609	<a href="#">Combustion Engines, Hydrogen Engines and CO<sub>2</sub> neutral Fuels II</a>			Koch, Kubach

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

oral examination, duration: 25 minutes, no auxiliary means

**Prerequisites**

none

**Recommendation**

Fundamentals of Combustion Engines II helpful

Below you will find excerpts from events related to this course:

V

**CO<sub>2</sub>-neutral combustion engines and their fuels II**

2134151, SS 2024, 3 SWS, Language: German, [Open in study portal](#)



Lecture / Practice (VÜ)  
On-Site





## T

## 8.40 Course: Competition in Networks [T-WIWI-100005]

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-101668 - Economic Policy I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	3

Events					
WT 24/25	2561204	<a href="#">Competition in Networks</a>	2 SWS	Lecture / 	Mitusch
WT 24/25	2561205	<a href="#">Übung zu Wettbewerb in Netzen</a>	1 SWS	Practice / 	Wisotzky, Mitusch, Corbo
Exams					
ST 2024	7900274	<a href="#">Competition in Networks</a>			Mitusch

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Result of success is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC). Examination is offered every semester and can be retried at any regular examination date.

**Prerequisites**

None.

**Recommendation**

Basics of microeconomics obtained within the undergraduate programme (B.Sc) of economics are required.

Below you will find excerpts from events related to this course:

## V

**Competition in Networks**

2561204, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
Blended (On-Site/Online)

**Content**

Network or infrastructure industries like telecommunication, transport, and utilities form the backbone of modern economies. The lecture provides an overview of the economic characteristics of network industries. The planning of networks is complicated by the multitude of aspects involved (like spatial differentiation and the like). The interactions of different companies - competition or cooperation or both - are characterized by complex interdependencies within the networks: network effects, economies of scale, effects of vertical integration, switching costs, standardization, compatibility etc. appear increasingly in these sectors and even tend to appear in combination. Additionally, government interventions can often be observed, partly driven by the aims of competition policy and partly driven by the aims industrial policy. All these issues are brought up, analyzed formally (in part) and illustrated by several examples in the lecture

**Literature**

Literatur und Skripte werden in der Veranstaltung angegeben.









T

## 8.41 Course: Computational Macroeconomics [T-WIWI-112723]

**Responsible:** Prof. Dr. Johannes Brumm  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-106472 - Advanced Macroeconomics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2024	2500162	<a href="#">Computational Macroeconomics</a>	2 SWS	Lecture / 	Krause, Brumm
ST 2024	2500164	<a href="#">Übung zu Computational Macroeconomics</a>	1 SWS	Practice / 	Hußmann
Exams					
ST 2024	7900163	<a href="#">Computational Macroeconomics</a>			Brumm

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment takes place in the form of a written 60 min. examination during the lecture-free period of the semester. The examination is offered every semester and can be repeated at any regular examination date.

**Prerequisites**

None

**Annotation**

New lecture starting summer semester 2024.

T

**8.42 Course: Computational Risk and Asset Management [T-WIWI-102878]**

**Responsible:** Prof. Dr. Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103120 - Financial Economics](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Irregular	5

**Competence Certificate**

The module examination takes the form of an alternative exam assessment.

The alternative exam assessment consists of a Python-based "Takehome Exam". At the end of the third week of January, the student is given a "Takehome Exam" which he processes and sends back independently within 4 hours using Python. Precise instructions will be announced at the beginning of the course. The alternative exam assessment can be repeated a maximum of once. A timely repeat option takes place at the end of the third week in March of the same year. More detailed instructions will be given at the beginning of the course.

**Prerequisites**

None.

**Recommendation**

Basic knowledge of capital markt theory.

T

## 8.43 Course: Constitution and Properties of Wearresistant Materials [T-MACH-102141]

**Responsible:** Prof. Sven Ulrich

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)


**Type**  
Oral examination





**Credits**  
4

**Grading scale**  
Grade to a third

**Recurrence**  
Each summer term

**Version**  
3

Events					
ST 2024	2194643	<a href="#">Constitution and Properties of Wear resistant materials</a>	2 SWS	Lecture / 	Ulrich
Exams					
ST 2024	76-T-MACH-102141	<a href="#">Constitution and Properties of Wearresistant Materials</a>			Ulrich

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

oral examination (about 30 min)

no tools or reference materials

### Prerequisites

none

Below you will find excerpts from events related to this course:

V

### Constitution and Properties of Wear resistant materials

2194643, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The assessment consists of an oral exam (ca. 30 min) taking place at the agreed date (according to Section 4(2), 2 of the examination regulation). The re-examination is offered upon agreement.

Teaching Content:

introduction

materials and wear

unalloyed and alloyed tool steels

high speed steels

stellites and hard alloys

hard materials

hard metals

ceramic tool materials

superhard materials

new developments

regular attendance: 22 hours

self-study: 98 hours

Basic understanding of constitution of wear-resistant materials, of the relations between constitution, properties and performance, of principles of increasing of hardness and toughness of materials as well as of the characteristics of the various groups of wear-resistant materials.

Recommendations: none

**Organizational issues**

Die Blockveranstaltung findet in folgendem Zeitraum statt:

15.04.-17.04.2024: jeweils von 8:00-16:00 Uhr;

Ort: KIT-CN, Geb. 681, Raum 214

Anmeldung verbindlich bis zum 13.04.2024 unter [svn.ulrich@kit.edu](mailto:svn.ulrich@kit.edu).

Nach der Anmeldung wird Ihnen im Falle einer Online-Veranstaltung der Link zur Vorlesung per E-Mail am 14.04.2024 mitgeteilt.

**Literature**

Laska, R. Felsch, C.: Werkstoffkunde für Ingenieure, Vieweg Verlag, Braunschweig, 1981

Schedler, W.: Hartmetall für den Praktiker, VDI-Verlage, Düsseldorf, 1988

Schneider, J.: Schneidkeramik, Verlag moderne Industrie, Landsberg am Lech, 1995



Kopien der Abbildungen und Tabellen werden verteilt; Copies with figures and tables will be distributed





## T

## 8.44 Course: Construction Technology [T-BGU-101691]

**Responsible:** Prof. Dr.-Ing. Shervin Haghsheno  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [M-BGU-101004 - Fundamentals of Construction](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
ST 2024	6200410	<a href="#">Construction Technology</a>	3 SWS	Lecture / 	Gentes, Haghsheno, Schneider
ST 2024	6200411	<a href="#">Exercises to Construction Technology</a>	1 SWS	Practice / 	Gentes, Haghsheno, Schneider, Waleczko
Exams					
ST 2024	8230101691	<a href="#">Construction Technology</a>			Haghsheno

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

written exam with 90 minutes

**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

T

## 8.45 Course: Consumer Behavior [T-WIWI-106569]

**Responsible:** Prof. Dr. Benjamin Scheibehenne  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101424 - Foundations of Marketing](#)  
[M-WIWI-105981 - Information Systems & Digital Business](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each summer term	4

Events					
ST 2024	2572174	<a href="#">Consumer Behavior</a>	3 SWS	Lecture	Scheibehenne
ST 2024	2572176	<a href="#">Übung zu Consumer Behavior</a>	1 SWS	Practice / ●	Liu, Scheibehenne
Exams					
ST 2024	7900009	<a href="#">Consumer Behavior</a>			Scheibehenne

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment of success takes the form of a presentation (weighting 20%) as part of the exercise and a written examination (90 minutes, weighting 80%).

The point system for the assessment will be announced at the beginning of the course.

**Prerequisites**

None.

**Annotation**

For further information, please contact the research group Marketing and Sales (<http://marketing.iism.kit.edu/>).

Below you will find excerpts from events related to this course:

V

**Consumer Behavior**

2572174, SS 2024, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content****Important information**

1. WIWI portal registration is required for the course. The registration will be open in March. Seats are limited to 30;
2. Übung associated with this course is MANDATORY: Students will be asked to do presentations in groups of 3 (introduce and discuss academic papers assigned by the lecturer). This will take place over one day (as a blocked event) during the semester (When and where will be decided at the beginning of the semester). This task will count towards 20% of the final grades of the "Consumer Behavior" class. There will be no weekly or biweekly Übung besides this event.

**Goal**

The goal of the class is to gain a better understanding of the situational, biological, cognitive, and evolutionary factors that drive consumer behavior. We will address these questions from an interdisciplinary perspective, including relevant theories and empirical research findings from Psychology, Marketing, Cognitive Science, Biology, and Economics.

**Description**

Consumer decisions are ubiquitous in daily life and they can have long-ranging and important consequences for individual (financial) well-being and health but also for societies and the planet as a whole. To help people making better choices it is important to understand the factors that influence their behavior. Towards this goal, we will explore how consumer behavior is shaped by social influences, situational and cognitive constraints, as well as by emotions, motivations, evolutionary forces, neuronal processes, and individual differences. Across all topics covered in class, we will engage with basic theoretical work as well as with groundbreaking empirical research and current scientific debates.

The lecture will be held in English.

**Grading**

Grading is based on two parts. An oral presentation that takes place in the Übung will count towards 20% of the grade. A written exam at the last day of class will make the rest 80%. The exam will cover the content of the lecture and the literature listed in the required reading list that will be made available to enrolled students on the first day of class. The exam questions will be in English. You are allowed to bring a language dictionary into the exam but you are not allowed to bring notes.

**Workload**

The total workload for this course is approximately 135 hours.

Presence time: 30 hours

Preparation and wrap-up of the course: 45 hours

Exam and exam preparation: 60 hours

**Organizational issues**

Wiwi portal sign up required

**Literature**

Will be made available to enrolled students on the first day of class.

T

**8.46 Course: Control of Mobile Machines [T-MACH-111821]**

**Responsible:** Simon Becker  
Prof. Dr.-Ing. Marcus Geimer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101266 - Automotive Engineering](#)  
[M-MACH-101267 - Mobile Machines](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	3

Exams				
ST 2024	76-T-MACH-111821	<a href="#">Control of mobile machines</a>		Becker, Geimer

**Competence Certificate**

The assessment consists of an oral exam (20 min) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

A prerequisite for participation in the examination is the preparation of a semester report. The preexamination with the code T-MACH-111820 must be passed.



T

**8.47 Course: Control of Mobile Machines – Prerequisites [T-MACH-111820]**

**Responsible:** Simon Becker  
Prof. Dr.-Ing. Marcus Geimer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101266 - Automotive Engineering](#)  
[M-MACH-101267 - Mobile Machines](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each summer term	1

Exams				
ST 2024	76-T-MACH-111820	<a href="#">Control of mobile machines - Advance</a>	Becker, Geimer	

**Competence Certificate**

Preparation of a report on the completion of the semester task

**Prerequisites**

none


T





**8.48 Course: Control Technology [T-MACH-105185]**

**Responsible:** Hon.-Prof. Dr. Christoph Gönheimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each summer term	2

Events					
ST 2024	2150683	<a href="#">Control Technology</a>	2 SWS	Lecture / 	Gönheimer
Exams					
ST 2024	76-T-MACH-105185	<a href="#">Control Technology</a>			Gönheimer
WT 24/25	76-T-MACH-105185	<a href="#">Control Technology</a>			Gönheimer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Written Exam (60 min)

**Prerequisites**

none

Below you will find excerpts from events related to this course:

V

**Control Technology**

2150683, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The lecture control technology gives an integral overview of available control components within the field of industrial production systems.

The first part of the lecture deals with the fundamentals of signal processing and with control peripherals in the form of sensors and actors which are used in production systems for the detection and manipulation of process states.

The second part handles with the function of electric control systems in the production environment. The main focus in this chapter is laid on programmable logic controls, computerized numerical controls and robot controls. Finally the course ends with the topic of cross-linking and decentralization with the help of bus systems.

The lecture is very practice-oriented and illustrated with numerous examples from different branches.

The following topics will be covered:

- Signal processing
- Control peripherals
- Programmable logic controls
- Numerical controls
- Controls for industrial robots
- Distributed control systems
- Field bus
- Trends in the area of control technology

**Learning Outcomes:**

The students ...

- are able to name the electrical controls which occur in the industrial environment and explain their function.
- can explain fundamental methods of signal processing. This involves in particular several coding methods, error protection methods and analog to digital conversion.
- are able to choose and to dimension control components, including sensors and actors, for an industrial application, particularly in the field of plant engineering and machine tools. Thereby, they can consider both, technical and economical issues.
- can describe the approach for projecting and writing software programs for a programmable logic control named Simatic S7 from Siemens. Thereby they can name several programming languages of the IEC 1131.

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Organizational issues**

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (<https://www.karlsruher-forschungsfabrik.de>) unterstützt.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (<https://www.karlsruher-forschungsfabrik.de/en.html>) to deepen the acquired knowledge.

**Literature****Medien:**

Skript zur Veranstaltung wird über ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in ilias (<https://ilias.studium.kit.edu/>).

**T 8.49 Course: Conveying Technology and Logistics [T-MACH-102135]**

**Responsible:** Prof. Dr.-Ing. Kai Furmans  
Paolo Pagani

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-WIWI-101816 - Seminar Module](#)

<b>Type</b> Examination of another type	<b>Credits</b> 3	<b>Grading scale</b> Grade to a third	<b>Recurrence</b> Each summer term	<b>Version</b> 1
--------------------------------------------	---------------------	------------------------------------------	---------------------------------------	---------------------

Events					
ST 2024	2119100	<a href="#">Fördertechnik und Logistiksysteme</a>		Seminar /	Furmans
WT 24/25	2119100	<a href="#">Fördertechnik und Logistiksysteme</a>		Seminar /	Furmans
Exams					
ST 2024	76-T-MACH-102135	<a href="#">Conveying Technology and Logistics</a>			Furmans

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**Fördertechnik und Logistiksysteme**

2119100, SS 2024, SWS, Language: German/English, [Open in study portal](#)

**Seminar (S)**  
On-Site

**Content**

The goal of the seminar is to deal with different topics related to the materials handling and logistics. Depending on the topic, the students can work on the either alone or in a group. At the end the results are presented and discussed with a final presentation. To prepare the work for the seminar an introductory event is scheduled at the beginning.

**Organizational issues**

Ort: Gebäude 50.38, Raum 0.22, Termine siehe homepage

**Fördertechnik und Logistiksysteme**

2119100, WS 24/25, SWS, Language: German/English, [Open in study portal](#)

**Seminar (S)**  
On-Site

**Content**

The goal of the seminar is to deal with different topics related to the materials handling and logistics. Depending on the topic, the students can work on the either alone or in a group. At the end the results are presented and discussed with a final presentation. To prepare the work for the seminar an introductory event is scheduled at the beginning.

**Organizational issues**

Weiteres siehe Homepage

**T 8.50 Course: Data-Driven Algorithms in Vehicle Technology [T-MACH-112126]**

**Responsible:** Dr. Stefan Scheubner  
**Organisation:** KIT Department of Mechanical Engineering  
**Part of:** [M-MACH-101265 - Vehicle Development](#)  
[M-MACH-101266 - Automotive Engineering](#)

<b>Type</b> Written examination	<b>Credits</b> 4	<b>Grading scale</b> Grade to a third	<b>Recurrence</b> Each winter term	<b>Expansion</b> 1 terms	<b>Version</b> 1
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Events					
WT 24/25	2113840	<a href="#">Data-Driven Algorithms in Vehicle Technology</a>	2 SWS	Lecture /	Scheubner
Exams					
ST 2024	7600001	<a href="#">Data-Driven Algorithms in Vehicle Technology</a>			Scheubner
WT 24/25	7600001	<a href="#">Data-Driven Algorithms in Vehicle Technology</a>			Scheubner

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**  
 Written Examination  
 Duration: 90 minutes

Below you will find excerpts from events related to this course:

**V Data-Driven Algorithms in Vehicle Technology** **Lecture (V)**  
**Blended (On-Site/Online)**  
 2113840, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

**Content**

Course Syllabus: Data-Driven Algorithms in Vehicle Technology  
 Motivation for the Course: Nowadays, engineers often develop technical systems using a combination of hard- and software. This is true especially for modern passenger vehicle development. In a digitalized world, such developments are built on knowledge gained from relevant data sources, e.g. the vehicle sensors. Therefore, engineers in automobile technology need qualifications from data science to successfully create new functionalities in the cars. To prevent remaining purely theoretical, the algorithms in this course are explained using a real-world problem of "EV Routing". Students have the opportunity to test methods in Python with frequent exercises presented.  
 Goal of the Course: Students have a basic understanding of data-driven algorithms such as Markov Models, Machine Learning or Monte-Carlo Methods. The approach for building data-driven models in automobile technology are known to students and they are able to test algorithms in the programming language "Python". Furthermore, students have learnt how to analyse the algorithm performance.  
 Content:  
 1. Introduction to function development as well as the prerequisites for the course (e.g. Fundamentals for running Python code)  
 2. Fundamentals for EV Routing and relevant data sources  
 3. Parameter estimation and state classification algorithms to determine the current situation of the vehicle  
 4. Learning methods for driver behaviour  
 5. Forecast algorithms to predict future energy consumption of an electric vehicle

**Organizational issues**

Das Vorlesungsmaterial wird auf ILIAS bereitgestellt. Das ILIAS-Passwort erhalten Sie unter <https://fast-web-01.fast.kit.edu/PasswoerterIlias/>

Die erste VL am 22.10.24 um 14:00 Uhr findet in Präsenz am Campus Ost, Geb. 70.04, Raum 219 statt.



Alle weiteren Vorlesungsinhalte werden als Videoaufzeichnungen in ILIAS bereit gestellt. In regelmäßigen Abständen wird es Sprechstunden geben. Die genauen Termine erfahren Sie dann über den entsprechenden ILIAS Kurs





## T

## 8.51 Course: Decision Theory [T-WIWI-102792]

**Responsible:** Prof. Dr. Karl-Martin Ehrhart  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101499 - Applied Microeconomics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	see Annotations	1

Events					
ST 2024	2520365	<a href="#">Decision Theory</a>	2 SWS	Lecture / 	Ehrhart
ST 2024	2520366	<a href="#">Übungen zu Entscheidungstheorie</a>	1 SWS	Practice / 	Ehrhart
Exams					
ST 2024	7900254	<a href="#">Decision Theory</a>			Ehrhart
WT 24/25	7900159	<a href="#">Decision Theory</a>			Ehrhart

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Success is assessed in the form of a written examination (in accordance with §4(2), 1 SPO) lasting 60 minutes. If the number of participants is low, an oral examination (according to §4 (2), 2 SPO) can also be offered.

The lecture will be offered for the last time in summer semester 2024.

The examination will be offered for the last time in the winter semester 2024/25. From the summer semester 2025, the examination will only be offered for repeaters.

### Prerequisites

None

### Recommendation

Knowledge in mathematics and statistics is required.

### Annotation

The lecture will be offered for the last time in summer semester 2024.

The examination will be offered for the last time in the winter semester 2024/25. From the summer semester 2025, the examination will only be offered for repeaters.

Below you will find excerpts from events related to this course:

## V

### Decision Theory

2520365, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
Blended (On-Site/Online)

### Literature

- Ehrhart, K.-M. und S.K. Berninghaus (2012): Skript zur Vorlesung Entscheidungstheorie, KIT.
- Hirshleifer und Riley (1997): The Analytics of Uncertainty and Information. London: Cambridge University Press, 4. Aufl.
- Berninghaus, S.K., K.-M. Ehrhart und W. Güth (2006): Strategische Spiele. Berlin u.a.: Springer, 2., überarbeitete und erweiterte Aufl. (oder erste Auflage, 2002)

T

## 8.52 Course: Derivatives [T-WIWI-102643]

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101402 - eFinance](#)  
[M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2024	2530550	<a href="#">Derivatives</a>	2 SWS	Lecture / 🗎	Uhrig-Homburg
ST 2024	2530551	<a href="#">Übung zu Derivate</a>	1 SWS	Practice / 🗎	Dinger, Uhrig-Homburg
Exams					
ST 2024	7900111	<a href="#">Derivatives</a>			Uhrig-Homburg
WT 24/25	7900051	<a href="#">Derivatives</a>			Uhrig-Homburg

Legend: 🗎 Online, 🗎 Blended (On-Site/Online), 🗎 On-Site, ✕ Cancelled

**Competence Certificate**

Depending on further pandemic developments, the examination will be offered either as a 60-minute written examination or as an open-book examination (alternative exam assessment).

A bonus can be earned by correctly solving at least 50% of the posed bonus exercises. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

**Prerequisites**

None

**Recommendation**

None

Below you will find excerpts from events related to this course:

V

**Derivatives**

2530550, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Literature**

- Hull (2012): Options, Futures, & Other Derivatives, Prentice Hall, 8th Edition

**Weiterführende Literatur:**

Cox/Rubinstein (1985): Option Markets, Prentice Hall



**T** 8.53 Course: Design and Development of Mobile Machines [T-MACH-105311]

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101267 - Mobile Machines](#)

<b>Type</b> Oral examination	<b>Credits</b> 4	<b>Grading scale</b> Grade to a third	<b>Recurrence</b> Each winter term	<b>Version</b> 1
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Events					
WT 24/25	2113079	<a href="#">Design and Development of Mobile Machines</a>	2 SWS	Lecture / 🗣️	Geimer
Exams					
ST 2024	76-T-MACH-105311	<a href="#">Design and Development of Mobile Machines</a>	Geimer		
WT 24/25	76-T-MACH-105311	<a href="#">Design and Development of Mobile Machines</a>	Geimer		

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✖ Canceled

**Competence Certificate**

The assessment consists of an oral exam (20 min) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

A registration is mandatory, the details will be announced on the webpages of the *Institute of Vehicle System Technology / Institute of Mobile Machines*. In case of too many applications, attendance will be granted based on pre-qualification.

The course will be replenished by interesting lectures of professionals from leading hydraulic companies.

**Prerequisites**

Required for the participation in the examination is the preparation of a report during the semester. The partial service with the code T-MACH-108887 must have been passed.

**Recommendation**

Knowledge in Fluid Power Systems (LV 2114093)

**Annotation**

After completion of the lecture, students can:

- design working and travel drive train hydraulics of mobile machines and can derive characteristic key factors.
- choose and apply suitable state of the art designing methods successfully
- analyse a mobile machines and break its structure down from a complex system to subsystems with reduced complexity
- identify and describe interactions and links between subsystems of a mobile machine
- present and document solutions of a technical problem according to R&D standards

The number of participants is limited.

**Content:**

The working scenario of a mobile machine depends strongly on the machine itself. Highly specialised machines, e.g. pavers are also as common as universal machines with a wide range of applications, e.g. hydraulic excavators. In general, all mobile machines are required to do their intended work in an optimal way and satisfy various criteria at the same time. This makes designing mobile machines to a great and interesting challenge. Nevertheless, usually key factors can be derived for every mobile machine, which affect all other machine parameters. During this lecture, those key factors and designing mobile machines accordingly will be addressed. To do so, an exemplary mobile machine will be discussed and designed in the lecture as a semester project.

**Literature:**

See german recommendations

Below you will find excerpts from events related to this course:

<b>V</b>	<p><b>Design and Development of Mobile Machines</b>                  2113079, WS 24/25, 2 SWS, Language: German, <a href="#">Open in study portal</a></p>	<p><b>Lecture (V)</b> On-Site</p>
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**Content**

Wheel loaders and excavators are highly specialized mobile machines. Their function is to detach, pick up and deposit materials near by. Significant size for dimensioning of the machines is the content of their standard shovel. In this lecture the main steps in dimensioning a wheel loader or excavator are being thought. This includes among others:

- Defining the size and dimensions,
- the dimensioning of the electric drive train,
- the dimensioning of the primary energy supply,
- Determining the kinematics of the equipment,
- the dimension of the working hydraulics and
- Calculations of strength

The entire design process of these machines is strongly influenced by the use of standards and guidelines (ISO/DIN-EN). Even this aspect is dealt with.

The lecture is based on the knowledge from the fields of mechanics, strength of materials, machine elements, propulsion and fluid technique. The lecture requires active participation and continued collaboration.

**Recommendations:**

Knowledge in Fluid Technology (SoSe, LV 21093)

- regular attendance: 21 hours
- self-study: 99 hours

**Literature**

Keine.

T

## 8.54 Course: Design and Development of Mobile Machines - Advance [T-MACH-108887]

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
Jan Siebert

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101267 - Mobile Machines](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each term	1

Exams			
WT 24/25	76-T-MACH-108887	<a href="#">Design and Development of Mobile Machines - Advance</a>	Geimer

### Competence Certificate

Preparation of semester report

### Prerequisites

none

**8.55 Course: Development Methods of Technical Systems [T-MACH-111283]**

**Responsible:** Dipl.-Ing. Thomas Maier  
Prof. Dr.-Ing. Jivka Ovtcharova

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	4	Grade to a third	Each term	1 terms	1

Events					
ST 2024	2121002	<a href="#">Development methods of technical systems</a>	4 SWS	Project (P / ●)	Meyer
WT 24/25	2121002	<a href="#">Development methods of technical systems</a>	4 SWS	Project (P / ●)	Meyer
Exams					
ST 2024	76-T-MACH-111283	<a href="#">Development Methods of Technical Systems</a>			Meyer

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Graded examination of other type weighted 50% project documentation and 50% colloquium.

**Prerequisites**

None

**Recommendation**

None

Below you will find excerpts from events related to this course:

**Development methods of technical systems**

2121002, SS 2024, 4 SWS, Language: German/English, [Open in study portal](#)

**Project (PRO)**  
**On-Site**

**Content**

Requirements, SysML, Modelica, FEM high performance computing, process modeling, VR/AR

Students can exemplarily:

- Collect requirements for large technical systems (e.b.: Helmholtz large-scale device KATRIN).
- Describe physical systems across domains with the modeling language Modelica and simulate the systems behavior.
- Generate simple FE meshes for simulations of structural mechanics.
- Perform general FEM analyses on mainframe computers and prepare and explain simulation results.
- As a team present the learned skills and document them continuously.

**Development methods of technical systems**

2121002, WS 24/25, 4 SWS, Language: German/English, [Open in study portal](#)

**Project (PRO)**  
**On-Site**

**Content**

Requirements, SysML, Modelica, FEM high performance computing, process modeling, VR/AR

Students can exemplarily:

- Collect requirements for large technical systems (e.b.: Helmholtz large-scale device KATRIN).
- Describe physical systems across domains with the modeling language Modelica and simulate the systems behavior.
- Generate simple FE meshes for simulations of structural mechanics.
- Perform general FEM analyses on mainframe computers and prepare and explain simulation results.
- As a team present the learned skills and document them continuously.

**Organizational issues**  
Zeit und Ort siehe ILIAS

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## 8.56 Course: Development of Hybrid Drivetrains [T-MACH-110817]

**Responsible:** Prof. Dr. Thomas Koch

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)


**Type**  
Written examination





**Credits**  
4

**Grading scale**  
Grade to a third

**Recurrence**  
Each summer term

**Version**  
1

Events					
ST 2024	2134155	<a href="#">Development of Hybrid Powertrains</a>	2 SWS	Lecture / 	Koch, Doppelbauer
Exams					
ST 2024	76-T-MACH-110817	<a href="#">Development of hybrid drivetrains</a>			Koch

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

written exam, 1 hour

### Prerequisites

None

Below you will find excerpts from events related to this course:

V

### Development of Hybrid Powertrains

2134155, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

1. Introduction and Goal
2. Alternative Powertrains
3. Fundamentals of Hybrid Powertrains
4. Fundamentals of Electric Components of Hybrid Powertrains
5. Interactions in Hybrid Powertrain Development
6. Overall System Optimization

**8.57 Course: Digital Democracy [T-WIWI-113160]**

**Responsible:** Jonas Fegert  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101434 - eBusiness and Service Management](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	4,5	Grade to a third	Each winter term	1 terms	1

Events					
WT 24/25	00053	<a href="#">Übung zur Digital Democracy</a>	1 SWS	Practice /	Stein
WT 24/25	2500045	<a href="#">Digital Democracy - Challenges and Opportunities of the Digital Society</a>	2 SWS	Seminar /	Fegert, Stein, Bezzaoui, Pekkip
WT 24/25	2600052	<a href="#">Digital Democracy</a>	2 SWS	Lecture /	Fegert

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Alternative exam assessment. The examination consists of two parts (presentation and oral exam). Details on the design of the exam will be announced at the beginning of the course.

**Annotation**

Limited to 25 students. Application (cover letter) via the Wiwi-portal.

Below you will find excerpts from events related to this course:

**Digital Democracy**

2600052, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**  
**Blended (On-Site/Online)**

**Content**

The "Digital Democracy" Lecture deals with opportunities and challenges of democracy and participation in a digitalized world. Social networks and other platforms have become a central place for human interaction.

These technologies open up many possibilities to connect people, promote societal discourse, and organize social movements. On the other hand, they are also used to undermine democracy by extremist forces.

One example is the spread of disinformation through social media, which can undermine trust in democratic institutions and exacerbate divisions in society. Big tech actors pursue their own economically driven interests, some of which run counter to societal ones.

So to what extent can Internet platforms help strengthen social discourse? And what measures can be taken to promote the quality and diversity of discourse in the digital world? What role do big tech players play in digital democracy and how can their interests be reconciled with democratic principles? These and many more questions will be explored in the lecture. The lecture introduces theoretical foundations and evidence-based research on digital democracy. It will address the following questions: What characterizes deliberative democracies, how do democracies change, and what can damage them? How does social polarization emerge and what drives it - off- and online. Accordingly, different platform types and phenomena of disinformation, such as clickbait, will be presented. The last part of the lecture series will deal with the search for approaches and alternatives to these problems.

The exercise session connected to this lecture is conducted in cooperation with an NGO and applies the lecture content in a practical context: The formulation of a data-based policy recommendation.

**Organizational issues**

Die Teilnahme am Kurs ist auf 25 Plätze beschränkt, diese erfolgt über das Wiwi-Portal: <https://portal.wiwi.kit.edu/ys/8373>

Der Kick-off findet am Fr, 25.10.2024 um 09:00 im 11.40 Seminarraum 231 statt.

**8.58 Course: Digital Markets and Market Design [T-WIWI-112228]**

**Responsible:** Prof. Dr. Adrian Hillenbrand  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101499 - Applied Microeconomics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2500035	<a href="#">Digital Markets and Market Design</a>	2 SWS	Lecture /	Hillenbrand
WT 24/25	2500036	<a href="#">Digital Markets and Market Design</a>	1 SWS	Practice /	Hillenbrand

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 minutes).

The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

**Annotation**

The lecture will be held in English.

Below you will find excerpts from events related to this course:

**Digital Markets and Market Design**

2500035, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

Online Markets determine our everyday lives. At the same time rapid technological advancements quickly change the landscape of online markets posing challenges for market design and consumer protection. In this course we apply theoretical economic models in the area of digital markets in order to make sense of current developments. Topics include consumer search, algorithmic pricing, recommender systems and steering, price discrimination and matching markets. We also discuss the potential effects of current policies like the Digital Markets Act and Digital Services Act on market outcomes.

**Digital Markets and Market Design**

2500036, WS 24/25, 1 SWS, Language: English, [Open in study portal](#)

Practice (Ü)  
On-Site

**Content**

Exercise Session for the course "Digital Markets and Market Design"

**Organizational issues**

Jede zweite Woche eine Übung



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## 8.59 Course: Digital Services: Foundations [T-WIWI-111307]

**Responsible:** Prof. Dr. Gerhard Satzger  
Dr. Michael Vössing

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-101434 - eBusiness and Service Management](#)  
[M-WIWI-102752 - Fundamentals of Digital Service Systems](#)  
[M-WIWI-105981 - Information Systems & Digital Business](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2024	2595466	<a href="#">Digital Services: Foundations</a>	2 SWS	Lecture / 🔄	Vössing, Satzger
ST 2024	2595467	<a href="#">Exercise Digital Services: Foundations</a>	1 SWS	Practice / 🔄	Vössing
Exams					
ST 2024	7900208	<a href="#">Digital Services: Foundations</a>			Satzger
WT 24/25	7900062	<a href="#">Digital Services: Foundations</a>			Satzger

Legend: 🟩 Online, 🔄 Blended (On-Site/Online), 🟦 On-Site, ✕ Cancelled

### Competence Certificate

The assessment consists of a written exam (60 min) (§4(2), 1 of the examination regulations).

### Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-WIWI-109938 - Digital Services](#) must not have been started.

### Annotation

The course will be offered in the form of a flipped classroom concept starting in summer semester 2023. The lecture will be recorded in advance and made available online. During the exercise classes, the contents of the lecture will be discussed and applied as part of programming exercises.

Below you will find excerpts from events related to this course:

V

### Digital Services: Foundations

2595466, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
Blended (On-Site/Online)

### Content

The world has been moving towards “service-led” economies: In many developed countries, services already account for more than 70% of the gross domestic product. In order to design, engineer, and manage services, traditional “goods-oriented” business models are often inappropriate. At the same time, the rapid development of information and communication technology (ICT) pushes “servitization” and the economic importance of digital services and, therefore, drives competition: Increased interaction and individualization options open up new dimensions of “value co-creation” between providers and customers; dynamic and scalable service value networks replace static value chains; services can instantly be delivered anywhere across the globe.

Building on a systematic categorization of different types of services and on the general notion of “value co-creation”, we cover concepts and foundations for engineering and managing ICT-based digital services, allowing for further specialization in other KSRI/IISM courses at the Master level. Topics in this course include an introduction to services and human-centered design, as well as an introduction to AI-based services, and IoT-based services. Additionally, essential concepts for the design of AI-based services are covered, such as fairness, sustainability, and human-AI collaboration in services. In this context, regulation approaches for novel technologies emerging out of the fast-paced world of digital services are discussed from legislation and industry perspectives. Finally, the lecture lays the practical foundations for implementing, distributing, and managing services at scale. Besides those contents, the lecture entails first-hand research insights, exercises and discussion sessions, and guest lectures that will illustrate the relevance of digital services in today’s world.

**Literature**


- Beverungen, D., Müller, O., Matzner, M., Mendling, J., & Vom Brocke, J. (2019). Conceptualizing smart service systems. *Electronic Markets*, 29(1), 7-18.
- Böhmman, T., Leimeister, J. M., & Möslin, K. (2014). Service systems engineering. *Business & Information Systems Engineering*, 6(2), 73-79.
- Cardoso, J., Fromm, H., Nickel, S., Satzger, G., Studer, R., & Weinhardt, C. (Eds.). (2015). *Fundamentals of service systems* (Vol. 12). Heidelberg: Springer.
- Davenport, T., & Harris, J. (2017). *Competing on analytics: Updated, with a new introduction: The new science of winning*. Harvard Business Press.
- Fromm, H., Habryn, F., & Satzger, G. (2012). Service analytics: Leveraging data across enterprise boundaries for competitive advantage. In *Globalization of professional services* (pp. 139-149). Springer, Berlin, Heidelberg.
- Ostrom, A. L., Parasuraman, A., Bowen, D. E., Patrício, L., & Voss, C. A. (2015). Service research priorities in a rapidly changing context. *Journal of Service Research*, 18(2), 127-159.
- Schüritz, R., & Satzger, G. (2016). Patterns of data-infused business model innovation. In *2016 IEEE 18th Conference on Business Informatics (CBI)* (Vol. 1, pp. 133-142). IEEE.
- Spohrer, J., Maglio, P. P., Bailey, J., & Gruhl, D. (2007). Steps toward a science of service systems. *Computer*, 40(1), 71-77.





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## 8.60 Course: Digitalization from Product Concept to Production [T-MACH-113647]

**Responsible:** Dr.-Ing. Marc Wawerla**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	4	Grade to a third	Each winter term	1 terms	1

Events					
WT 24/25	2149702	<a href="#">Digitalization from Product Concept to Production</a>	2 SWS	Lecture / 	Wawerla
Exams					
WT 24/25	76-T-MACH-113647	<a href="#">Digitalization from Product Concept to Production</a>	Wawerla		

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Alternative test achievement (graded):

- Written processing of a case study (weighting 50%) and
- Presentation of the results (ca. 10 min.) followed by a colloquium (ca. 30 min.), (weighting 50%)

**Prerequisites**

none

**Annotation**

For organisational reasons, the number of participants for the course is limited. As a result, a selection process will take place. Further information for application can be found via: <https://www.wbk.kit.edu/english/education.php>.

Below you will find excerpts from events related to this course:

V

**Digitalization from Product Concept to Production**2149702, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)Lecture (V)  
On-Site

**Content**

The lecture deals with Digitalization along the entire value chain end-to-end, with a focus on production and supply chain. Within this context, concepts, tools, methods, technologies and concrete applications in the industry are presented. Furthermore, the students get the opportunity to get first-hand insights into the digitalization journey of a German technology company.

Main topics of the lecture:

- Concepts and methods such as disruptive innovation and agile project management
- Overview on technologies at disposal
- Practical approaches in innovation
- Applications in industry
- Field trip to ZEISS

**Learning Outcomes:**

The students ...

- are capable to comment on the content covered by the lecture.
- are able to analyze and evaluate the suitability of digitalization technologies in the optical industry.
- are able to assess the applicability of methods such as disruptive innovation and agile project management.
- are able to appreciate the practical challenges to digitalization in industry.

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Organizational issues**

Aus organisatorischen Gründen ist die Teilnehmeranzahl für die Lehrveranstaltung begrenzt. Infolgedessen wird ein Auswahlprozess stattfinden. Weitere Informationen zur Bewerbung sind unter <https://www.wbk.kit.edu/studium-und-lehre.php> zu finden.

For organisational reasons, the number of participants for the course is limited. As a result, a selection process will take place. Further information for application can be found via: <https://www.wbk.kit.edu/english/education.php>.

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## 8.61 Course: Drive Train of Mobile Machines [T-MACH-105307]

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101267 - Mobile Machines](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2113077	<a href="#">Drive Train of Mobile Machines</a>	2 SWS	Lecture / 🗣️	Geimer
WT 24/25	2113078	<a href="#">Übung zu 'Antriebsstrang mobiler Arbeitsmaschinen'</a>	1 SWS	Practice / 🗣️	Geimer, Barga-Herzog
Exams					
ST 2024	76-T-MACH-105307	<a href="#">Drive Train of Mobile Machines</a>			Geimer
WT 24/25	76-T-MACH-105307	<a href="#">Drive Train of Mobile Machines</a>			Geimer

Legend: 🗣️ Online, 🗣️🗣️ Blended (On-Site/Online), 🗣️ On-Site, ✕ Cancelled

### Competence Certificate

The final assessment will be an oral examination (20 min) taking place during the recess period. The examination will be offered in every semester and can be repeated at any regular examination date.

### Prerequisites

none

### Recommendation

- General principles of mechanicals engineering
- Basic knowledge of hydraulics
- Interest in mobile machinery

### Annotation

At the end of the lecture, participants can explain the structure and function of all discussed drive trains of mobile machines. They can analyze complex gearbox schematics and synthesize simple transmission functions using rough calculations.

### Content:

In this course the different drive trains of mobile machinery will be discussed. The focus of this course is:

- mechanical gears
- torque converter
- hydrostatic drives
- power split drives
- electrical drives
- hybrid drives
- axles
- terra mechanics

**Media:** projector presentation

**Literature:** Download of lecture slides from ILIAS. Further literature recommendations during lectures.

Below you will find excerpts from events related to this course:

## V

### Drive Train of Mobile Machines

2113077, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

In this course will be discussed the different drive train of mobile machinerys. The fokus of this course is:

- improve knowledge of fundamentals
- mechanical gears
- torque converter
- hydrostatic drives
- continuous variable transmission
- eletrical drives
- hybrid drives
- axles
- terra mechanic

**Recommendations:**

- general basics of mechanical engineering
- basic knowledge in hydraulics
- interest in mobile machines
  
- regular attendance: 21 hours
- self-study: 89 hours

**Literature**

Skriptum zur Vorlesung downloadbar über ILIAS

**8.62 Course: Economics and Behavior [T-WIWI-102892]**

**Responsible:** Prof. Dr. Nora Szech  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-101501 - Economic Theory](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2560137	<a href="#">Economics and Behavior</a>	2 SWS	Lecture /	Rau
WT 24/25	2560138	<a href="#">Übung zu Economics and Behavior</a>	1 SWS	Practice /	Zhao
Exams					
ST 2024	7900154	<a href="#">Economics and Behavior (2)</a>			Puppe
WT 24/25	7900134	<a href="#">Exam Economics and Behavior</a>			Puppe

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

**Recommendation**

Basic knowledge of microeconomics and statistics are recommended. A background in game theory is helpful, but not absolutely necessary.

**Annotation**

The lecture will be held in English.

*Below you will find excerpts from events related to this course:*

**Economics and Behavior**

2560137, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)  
On-Site**

**Content**

The course covers topics from behavioral economics with regard to contents and methods. In addition, the students gain insight into the design of economic experiments. Furthermore, the students will become acquainted with reading and critically evaluating current research papers in the field of behavioral economics.

The students

- gain insight into fundamental topics in behavioral economics;
- get to know different research methods in the field of behavioral economics;
- learn to critically evaluate experimental designs;
- get introduced to current research papers in behavioral economics;
- become acquainted with the technical terminology in English.

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

The grade will be determined in a final written exam. Students can earn a bonus to the final grade by successfully participating in the exercises.

The total workload for this course is approximately 135.0 hours. For further information see German version.

The lecture will be held in English.

**Recommendations:**

Basic knowledge of microeconomics and statistics are recommended. A background in game theory is helpful, but not absolutely necessary.

**Literature**

Kahnemann, Daniel: Thinking, Fast and Slow. Farrar, Straus and Giroux, 2011.

Ariely, Dan: Predictably Irrational. New York: HarperCollins, 2008.

Ariely, Dan: The Upside of Irrationality. New York: HarperCollins 2011.



**8.63 Course: Economics I: Microeconomics [T-WIWI-102708]**

**Responsible:** Prof. Dr. Clemens Puppe  
Prof. Dr. Johannes Philipp Reiß

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-100950 - Preliminary Exam](#)  
[M-WIWI-101398 - Introduction to Economics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	1

Events					
WT 24/25	2610012	<a href="#">Economics I: Microeconomics</a>	3 SWS	Lecture /	Reiß, Potarca
WT 24/25	2610013			Tutorial ( /	Reiß, Potarca

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (120 min) following §4, Abs. 2, 1 of the examination regulation.

The main exam takes place subsequent to the lecture. The re-examination is offered at the same examination period. As a rule, only repeating candidates are entitled for taking place the re-examination. For a detailed description on the exam regulations see the information of the respective chair.

**Prerequisites**

None

Below you will find excerpts from events related to this course:

**Economics I: Microeconomics**

2610012, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

This course provides a solid grounding in microeconomic theory. The two main parts of the course deal with questions of microeconomic decision theory (household and firm decisions) and questions of market theory (equilibria and efficiency on competitive markets). The last part of the lecture deals with problems of imperfect competition (oligopoly markets) as well as the basics of game theory and welfare economics.

**Learning objectives:**

The main aim of the course is to teach students the basics of thinking in microeconomic models. In particular, students should be able to analyze goods markets and the determinants of market outcomes. In detail, students will learn

- to name and define the basic microeconomic terms.
- to explain the interrelationships in microeconomic models.
- to calculate the important parameters of microeconomic models.
- to judge the possible effects of economic policy measures on the behavior of economic agents (in simple decision problems) and possibly propose alternative measures.
- to analyze as a participant in a tutorial simple microeconomic problems by solving written exercises and presenting the results of the exercises on the blackboard.
- to become familiar with the basic literature on microeconomics.

In this way, students acquire the necessary basic knowledge

- to recognize the structure of economic problems on a microeconomic level and develop proposals for solutions.
- to provide active decision support for simple economic decision problems.

**Workload:**

Total workload for 5 credit points: approx. 150 hours

Attendance: 45 hours

Self-study: 105 hours

**Literature**

- Varian, H. R. 2016. *Grundzüge der Mikroökonomik*. 9. Auflage. De Gruyter Oldenburg Verlag.
- Pindyck, R. S. und Rubinfeld, D. L. 2015. *Mikroökonomie*. 8. Auflage. Pearson.
- Frank, R. H. 2006. *Microeconomics and Behavior*. 6. Auflage. McGraw-Hill/Irwin.

T

**8.64 Course: Economics II: Macroeconomics [T-WIWI-102709]**

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101398 - Introduction to Economics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	1

Events					
ST 2024	2600014	<a href="#">Economics II: Macroeconomics</a>	4 SWS	Lecture	Ott
ST 2024	2660015	<a href="#">Economics II : Macroeconomics, Tutorial</a>	2 SWS	Tutorial (	Mirzoyan, Scheidt, Zoroglu
Exams					
ST 2024	7900215	<a href="#">Economics II: Macroeconomics</a>			Ott
WT 24/25	7900197	<a href="#">Economics II: Macroeconomics</a>			Ott

**Competence Certificate**

Depending on further pandemic developments, the examination will be offered either as a 120-minute written examination (written examination according to SPO § 4 Abs. 2, Pkt. 1) or as an open-book examination (alternative exam assessment according to SPO § 4 Abs. 2, Pkt. 3).

**Prerequisites**

None

*Below you will find excerpts from events related to this course:*

V

**Economics II: Macroeconomics**2600014, SS 2024, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content****Classical Theory of Macroeconomic Production**

Chapter 1: Gross domestic product

Chapter 2: Money and Inflation

Chapter 3: Open Economy I

Chapter 4: Unemployment

**Growth: The economy in the long term**

Chapter 5: Growth I

Chapter 6: Growth II

**Business cycle: The economy in the short term**

Chapter 7: Economy and aggregate demand I

Chapter 8: Economy and aggregate demand II

Chapter 9: Open Economy II

Chapter 10: Macroeconomic supply

**Advanced topics of macroeconomics**

Chapter 11: Dynamic model of the economy as a whole

Chapter 12: Microeconomic foundations

Chapter 13: Macroeconomic economic policy

**Learning goals:**

The students. . .

- can name the basic indicators, technical terms and concepts of macroeconomics.
- can use models to reduce complex relationships to their basic components.
- can analyse economic policy debates and form their own opinion on them.

**Workload:**

Total effort for 5 credit points: approx. 150 hours

Presence time: 45 hours

Before and after the LV: 67.5 hours

Exam and exam preparation: 37.5 hours

**Literature**


Als Grundlage dieser Veranstaltung dient das bekannte Lehrbuch „Makroökonomik“ von Greg Mankiw vom Schäffer Poeschel Verlag in der aktuellen Fassung.





T

## 8.65 Course: Economics III: Introduction in Econometrics [T-WIWI-102736]

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-101599 - Statistics and Econometrics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	2

Events					
ST 2024	2520016	<a href="#">Economics III: Introduction to Econometrics</a>	2 SWS	Lecture / 	Schienle, Bracher
ST 2024	2520017	<a href="#">Übungen zu VWL III</a>	2 SWS	Practice	Schienle, Rüter, Bracher, Leimenstoll
Exams					
ST 2024	7900044	<a href="#">Economics III: Introduction in Econometrics</a>			Schienle
WT 24/25	7900002	<a href="#">Economics III: Introduction in Econometrics</a>			Schienle

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Depending on further pandemic developments, the examination will be offered either as a 90-minute written examination (written examination according to SPO § 4 Abs. 2, Pkt. 1) or as an open-book examination (alternative exam assessment according to SPO § 4 Abs. 2, Pkt. 3).

### Prerequisites

None

Below you will find excerpts from events related to this course:

V

### Economics III: Introduction to Econometrics

2520016, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

#### Learning objectives:

- Familiarity with the basic concepts and methods of econometrics
- Preparation of simple econometric surveys

#### Content:

- Simple and multiple linear regression (estimating parameters, confidence interval, testing, prognosis, testing assumptions)
- Model assessment

#### Requirements:

Knowledge of the lectures Statistics I + II is required.

#### Workload:

Total workload for 5 CP: approx. 150 hours

Attendance: 30 hours

Preparation and follow-up: 120 hours

#### Literature

Von Auer: Ökonometrie ISBN 3-540-00593-5

Goldberger: A course in Econometrics ISBN 0-674-17544-1

Gujarati. Basic Econometrics ISBN 0-07-113964-8

Schneeweiß: Ökonometrie ISBN 3-7908-0008-2

## T

## 8.66 Course: eFinance: Information Systems for Securities Trading [T-WIWI-110797]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101402 - eFinance](#)  
[M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101434 - eBusiness and Service Management](#)  
[M-WIWI-101465 - Topics in Finance I](#)  
[M-WIWI-105981 - Information Systems & Digital Business](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2540454	<a href="#">eFinance: Information Systems for Securities Trading</a>	2 SWS	Lecture /	Weinhardt
WT 24/25	2540455	<a href="#">Übungen zu eFinance: Information Systems for Securities Trading</a>	1 SWS	Practice /	Motz, Motz
Exams					
ST 2024	7900269	<a href="#">eFinance: Information Systems for Securities Trading</a>			Weinhardt

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

Success is monitored by means of ongoing elaborations and presentations of tasks and an examination (60 minutes) at the end of the lecture period. The scoring scheme for the overall evaluation will be announced at the beginning of the course.

### Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-WIWI-102600 - eFinance: Information Engineering and Management for Securities Trading](#) must not have been started.

### Annotation

The course "eFinance: Information Systems for Securities Trading" covers different actors and their function in the securities industry in-depth, highlighting key trends in modern financial markets, such as Distributed Ledger Technology, Sustainable Finance, and Artificial Intelligence. Security prices evolve through a large number of bilateral trades, performed by market participants that have specific, well-regulated and institutionalized roles. Market microstructure is the subfield of financial economics that studies the price formation process. This process is significantly impacted by regulation and driven by technological innovation. Using the lens of theoretical economic models, this course reviews insights concerning the strategic trading behaviour of individual market participants, and models are brought market data. Analytical tools and empirical methods of market microstructure help to understand many puzzling phenomena in securities markets.

Below you will find excerpts from events related to this course:

## V

### eFinance: Information Systems for Securities Trading

2540454, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

### Literature

- Picot, Arnold, Christine Bortenlänger, Heiner Röhl (1996): "Börsen im Wandel". Knapp, Frankfurt
- Harris, Larry (2003): "Trading and Exchanges - Market Microstructure for Practitioners". Oxford University Press, New York

### Weiterführende Literatur:

- Gomber, Peter (2000): "Elektronische Handelssysteme - Innovative Konzepte und Technologien". Physika Verlag, Heidelberg
- Schwartz, Robert A., Reto Francioni (2004): "Equity Markets in Action - The Fundamentals of Liquidity, Market Structure and Trading". Wiley, Hoboken, NJ

T

**8.67 Course: Electric Energy Systems [T-ETIT-112850]**

**Responsible:** Prof. Dr.-Ing. Marc Hiller  
Prof. Dr.-Ing. Thomas Leibfried

**Organisation:** KIT Department of Electrical Engineering and Information Technology

**Part of:** [M-ETIT-106821 - Electric Energy Systems and Power Generation](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

**Prerequisites**  
none

T

## 8.68 Course: Electrical Engineering for Business Engineers, Part I [T-ETIT-100533]

**Responsible:** Dr. Wolfgang Menesklou**Organisation:** KIT Department of Electrical Engineering and Information Technology**Part of:** M-ETIT-101155 - Electrical Engineering



Type
Written examination





Credits
3

Grading scale
Grade to a third

Recurrence
Each winter term

Version
1

Events					
WT 24/25	2304223	Electrical Engineering for Business Engineers, Part I	2 SWS	Lecture / 	Menesklou
WT 24/25	2304225	Electrical Engineering for Business Engineers, Part I (Exercise to 2304223)	2 SWS	Practice / 	Menesklou
Exams					
ST 2024	7304223	Electrical Engineering for Business Engineers, Part I			Menesklou
WT 24/25	7304223	Electrical Engineering for Business Engineers, Part I			Menesklou


Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled







T

## 8.69 Course: Electrical Engineering for Business Engineers, Part II [T-ETIT-100534]

**Responsible:** Dr. Wolfgang Menesklou**Organisation:** KIT Department of Electrical Engineering and Information Technology**Part of:** [M-MACH-101261 - Emphasis in Fundamentals of Engineering](#)  
[M-WIWI-101839 - Additional Fundamentals of Engineering](#)**Type**  
Written examination**Credits**  
5**Grading scale**  
Grade to a third**Recurrence**  
Each summer term**Version**  
1

Events					
ST 2024	2304224	<a href="#">Elektrotechnik II für Wirtschaftsingenieure</a>	3 SWS	Lecture / 	Menesklou
Exams					
ST 2024	7304224	<a href="#">Electrical Engineering for Business Engineers, Part II</a>			Menesklou
WT 24/25	7304224	<a href="#">Electrical Engineering for Business Engineers, Part II</a>			Menesklou


Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled





T

**8.70 Course: Energy Policy [T-WIWI-102607]**

**Responsible:** Prof. Dr. Martin Wietschel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101464 - Energy Economics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each summer term	3

Events					
ST 2024	2581959	<a href="#">Energy Policy</a>	2 SWS	Lecture / 	Wietschel
Exams					
ST 2024	7981959	<a href="#">Energy Policy</a>			Fichtner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

**Prerequisites**

None.

Below you will find excerpts from events related to this course:

V

**Energy Policy**

2581959, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The availability of cheap, environmentally friendly and secure energy is crucial for human welfare. However, the increasing scarcity of resources and increasing environmental pressures, with a particular focus on climate change, threaten human welfare through economic action. Energy contributes significantly to environmental pollution. The energy industry is characterised by high regulation and a significant influence of political decisions.

At the beginning of the lecture different perspectives on energy policy will be presented and the analysis of political decision-making processes will be discussed. Then the current energy policy challenges in the area of environmental pollution, regulation and the role of energy for households and industry will be discussed. Then the actors of energy policy and energy responsibilities in Europe will be discussed. The economic approaches from traditional environmental economics and sustainability as a new policy approach will then be discussed. Finally, energy policy instruments such as the promotion of renewable energies or energy efficiency are discussed in detail and how they can be evaluated.


The lecture emphasizes the relationship between theory and practice and presents some case studies.





**Literature**

Wird in der Vorlesung bekannt gegeben.

T

**8.71 Course: Engine Measurement Techniques [T-MACH-105169]****Responsible:** Dr.-Ing. Sören Bernhardt**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101303 - Combustion Engines II](#)**Type**  
Oral examination**Credits**  
4**Grading scale**  
Grade to a third**Recurrence**  
Each summer term**Version**  
1

Events					
ST 2024	2134137	<a href="#">Engine measurement techniques</a>	2 SWS	Lecture / 	Bernhardt
Exams					
ST 2024	76-T-MACH-105169	<a href="#">Engine Measurement Techniques</a>			Koch

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

oral examination, Duration: 0,5 hours, no auxiliary means

**Prerequisites**

none

**Recommendation**

T-MACH-102194 Combustion Engines I

*Below you will find excerpts from events related to this course:*

V

**Engine measurement techniques**2134137, SS 2024, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**  
On-Site**Literature**

1. Grohe, H.: Messen an Verbrennungsmotoren
2. Bosch: Handbuch Kraftfahrzeugtechnik
3. Veröffentlichungen von Firmen aus der Meßtechnik
4. Hoffmann, Handbuch der Meßtechnik
5. Klingenberg, Automobil-Meßtechnik, Band C

T

**8.72 Course: Exam on Climatology [T-PHYS-105594]**

**Responsible:** Prof. Dr. Joaquim José Ginete Werner Pinto  
**Organisation:** KIT Department of Physics  
**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Grading scale	Version
Oral examination	5	Grade to a third	5

Exams			
ST 2024	7800052	<a href="#">Exam on Climatology as Minor Subject</a>	Ginete Werner Pinto
ST 2024	7800139	<a href="#">Climatology reexam</a>	Ginete Werner Pinto

## T

## 8.73 Course: Facility Location and Strategic Supply Chain Management [T-WIWI-102704]

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101413 - Applications of Operations Research](#)  
[M-WIWI-101414 - Methodical Foundations of OR](#)  
[M-WIWI-101421 - Supply Chain Management](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	4

Events					
WT 24/25	2550486	<a href="#">Facility Location and Strategic Supply Chain Management</a>	2 SWS	Lecture /	Nickel
WT 24/25	2550487	<a href="#">Exercises for Facility Location and Strategic Supply Chain Management</a>	1 SWS	Practice /	Hoffmann
Exams					
ST 2024	7900027	<a href="#">Facility Location and Strategic Supply Chain Management</a>			Nickel
WT 24/25	7900091	<a href="#">Facility Location and Strategic Supply Chain Management</a>			Nickel

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

The assessment consists of a written exam (60 min) according to Section 4 (2), 1 of the examination regulation. The exam takes place in every semester. Prerequisite for admission to examination is the successful completion of the online assessments.

### Prerequisites

Prerequisite for admission to examination is the successful completion of the online assessments.

### Recommendation

None

### Annotation

The lecture is held in every winter term. The planned lectures and courses for the next three years are announced online.

Below you will find excerpts from events related to this course:

## V

## Facility Location and Strategic Supply Chain Management

2550486, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Organizational issues

Für die Klausurzulassung müssen 4 von 5 Online-Tests bestanden sein.

Die Zulassung ist ein Jahr gültig, außer es handelt sich um einen Zweitversuch. In diesem Falle müssen die Online-Tests nicht erneut absolviert werden.

### Literature

#### Weiterführende Literatur:

- Daskin: Network and Discrete Location: Models, Algorithms, and Applications, Wiley, 1995
- Domschke, Drexl: Logistik: Standorte, 4. Auflage, Oldenbourg, 1996
- Francis, McGinnis, White: Facility Layout and Location: An Analytical Approach, 2nd Edition, Prentice Hall, 1992
- Love, Morris, Wesolowsky: Facilities Location: Models and Methods, North Holland, 1988
- Thonemann: Operations Management - Konzepte, Methoden und Anwendungen, Pearson Studium, 2005

T

## 8.74 Course: Failure of Structural Materials: Deformation and Fracture [T-MACH-102140]

**Responsible:** Prof. Dr. Peter Gumbsch  
Dr. Daniel Weygand

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2181711	<a href="#">Failure of structural materials: deformation and fracture</a>	3 SWS	Lecture / Practice (/)	Gumbsch, Weygand
Exams					
ST 2024	76-T-MACH-102140	<a href="#">Failure of Structural Materials: Deformation and Fracture</a>			Weygand, Gumbsch
WT 24/25	76-T-MACH-102140	<a href="#">Failure of Structural Materials: Deformation and Fracture</a>			Weygand, Gumbsch, Kraft

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

oral exam ca. 30 minutes

no tools or reference materials

### Prerequisites

none

### Recommendation

preliminary knowlegde in mathematics, mechanics and materials science

Below you will find excerpts from events related to this course:

V

### Failure of structural materials: deformation and fracture

2181711, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)  
On-Site

**Content**

1. Introduction
2. linear elasticity
3. classification of stresses
4. Failure due to plasticity
  - tensile test
  - dislocations
  - hardening mechanisms
  - guidelines for dimensioning
5. composite materials
6. fracture mechanics
  - hypotheses for failure
  - linear elastic fracture mechanics
  - crack resistance
  - experimental measurement of fracture toughness
  - defect measurement
  - crack propagation
  - application of fracture mechanics
  - atomistics of fracture

**The student**

- has the basic understanding of mechanical processes to explain the relationship between externally applied load and materials strength.
- can explain the foundation of linear elastic fracture mechanics and is able to determine if this concept can be applied to a failure by fracture.
- can describe the main empirical materials models for deformation and fracture and can apply them.
- has the physical understanding to describe and explain phenomena of failure.

preliminary knowledge in mathematics, mechanics and materials science recommended

regular attendance: 22,5 hours

self-study: 97,5 hours

The assessment consists of an oral examination (ca. 30 min) according to Section 4(2), 2 of the examination regulation.

**Organizational issues**

Übungstermine werden in der Vorlesung bekannt gegeben!

**Literature**

- Engineering Materials, M. Ashby and D.R. Jones (2nd Edition, Butterworth-Heinemann, Oxford, 1998); sehr lesenswert, relativ einfach aber dennoch umfassend, verständlich
- Mechanical Behavior of Materials, Thomas H. Courtney (2nd Edition, McGraw Hill, Singapur); Klassiker zu den mechanischen Eigenschaften der Werkstoffe, umfangreich, gut
- Bruchvorgänge in metallischen Werkstoffen, D. Aurich (Werkstofftechnische Verlagsgesellschaft Karlsruhe), relativ einfach aber dennoch umfassender Überblick für metallische Werkstoffe

T


## 8.75 Course: Failure of Structural Materials: Fatigue and Creep [T-MACH-102139]





**Responsible:** Dr. Patric Gruber  
Prof. Dr. Peter Gumbsch

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2181715	<a href="#">Failure of Structural Materials: Fatigue and Creep</a>	2 SWS	Lecture / 	Gruber, Gumbsch
Exams					
ST 2024	76-T-MACH-102139	<a href="#">Failure of Structural Materials: Fatigue and Creep</a>			Gruber, Gumbsch
WT 24/25	76-T-MACH-102139	<a href="#">Failure of Structural Materials: Fatigue and Creep</a>			Gruber, Gumbsch

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

#### Competence Certificate

oral exam ca. 30 minutes

no tools or reference materials

#### Prerequisites

none

#### Recommendation

preliminary knowledge in mathematics, mechanics and materials science

Below you will find excerpts from events related to this course:

V

#### Failure of Structural Materials: Fatigue and Creep

2181715, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site



**Content**

## 1 Fatigue

## 1.1 Introduction

## 1.2 Lifetime

## 1.3 Fatigue Mechanisms

## 1.4 Material Selection

## 1.5 Notches and Shape Optimization

## 1.6 Case Studies: ICE-Accidents

## 2 Creep

## 2.1 Introduction

## 2.2 High Temperature Plasticity

## 2.3 Phänomenological Description of Creep

## 2.4 Creep Mechanisms

## 2.5 Alloying Effects

## The student

- has the basic understanding of mechanical processes to explain the relationships between externally applied load and materials strength.
- can describe the main empirical materials models for fatigue and creep and can apply them.
- has the physical understanding to describe and explain phenomena of failure.
- can use statistical approaches for reliability predictions.
- can use its acquired skills, to select and develop materials for specific applications.

preliminary knowledge in mathematics, mechanics and materials science recommended

regular attendance: 22,5 hours

self-study: 97,5 hours

The assessment consists of an oral examination (ca. 30 min) according to Section 4(2), 2 of the examination regulation.

**Literature**

- Engineering Materials, M. Ashby and D.R. Jones (2nd Edition, Butterworth-Heinemann, Oxford, 1998); sehr lesenswert, relativ einfach aber dennoch umfassend, verständlich
- Mechanical Behavior of Materials, Thomas H. Courtney (2nd Edition, McGraw Hill, Singapur); Klassiker zu den mechanischen Eigenschaften der Werkstoffe, umfangreich, gut
- Bruchvorgänge in metallischen Werkstoffen, D. Aurich (Werkstofftechnische Verlagsgesellschaft Karlsruhe), relativ einfach aber dennoch umfassender Überblick für metallische Werkstoffe
- Fatigue of Materials, Subra Suresh (2nd Edition, Cambridge University Press); Standardwerk über Ermüdung, alle Materialklassen, umfangreich, für Einsteiger und Fortgeschrittene

## T

## 8.76 Course: Fatigue of Materials [T-MACH-112106]

**Responsible:** Dr.-Ing. Stefan Guth

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)


**Type**  
Oral examination





**Credits**  
4

**Grading scale**  
Grade to a third

**Recurrence**  
Each summer term

**Version**  
2

Events					
ST 2024	2173586	<a href="#">Fatigue of Materials</a>	2 SWS	Lecture / 	Guth
Exams					
ST 2024	76-T-MACH-112106	<a href="#">Fatigue of Materials</a>			Guth
WT 24/25	76-T-MACH-112106	<a href="#">Fatigue of Materials</a>			Guth

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Oral exam, about 20 minutes

### Prerequisites

none

### Recommendation

Basic knowledge in Materials Science will be helpful.

Below you will find excerpts from events related to this course:

## V

### Fatigue of Materials

2173586, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

- Introduction: historical review and some fatigue damage cases
- Cyclic Stress Strain Behaviour
- Crack Initiation
- Crack Propagation
- Lifetime Behaviour under Cyclic Loading
- Fatigue of Notched Components
- Structural Durability
- Fatigue of composites and compound materials

### learning objectives:

The students are able to recognise the deformation and the failure behaviour of materials under cyclic loading and to assign it to the basic microstructural processes. They know the sequence and the development of fatigue damages and can evaluate the initiation and the growth of fatigue cracks.

The students can evaluate the cyclic strength behaviour of materials and components both qualitatively and quantitatively and know the procedures for the assessment of single-stage, multistage and stochastic cyclical loadings.

### requirements:

none, basic knowledge in Material Science will be helpful

### workload:

regular attendance: 21 hours

self-study: 99 hours

### Literature

Ein Manuskript, das auch aktuelle Literaturhinweise enthält, wird in der Vorlesung verteilt.

**8.77 Course: Financial Accounting for Global Firms [T-WIWI-107505]**

**Responsible:** Dr. Torsten Luedecke  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2530242	<a href="#">Financial Accounting for Global Firms</a>	2 SWS	Lecture /	Luedecke
WT 24/25	2530243	<a href="#">Übung zu Financial Accounting for Global Firms</a>	1 SWS	Practice /	Luedecke
Exams					
ST 2024	7900195	<a href="#">Financial Accounting for Global Firms</a>			Luedecke
WT 24/25	7900142	<a href="#">Financial Accounting for Global Firms</a>			Luedecke, Ruckes

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

**Prerequisites**

None

**Recommendation**

Basic knowledge in corporate finance and accounting.

**Annotation**

New lecture in the winter term 2017/18.

Below you will find excerpts from events related to this course:

**Financial Accounting for Global Firms**

2530242, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

**Literature**

Alexander, D. and C. Nobes (2017): Financial Accounting – An International Introduction, 6th ed., Pearson.

Coenenberg, A.G., Haller, A. und W. Schultze (2016): Jahresabschluss und Jahresabschlussanalyse, 24. Auflage. Schäffer-Poeschel Verlag Stuttgart.

**8.78 Course: Financial Econometrics [T-WIWI-103064]**

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101599 - Statistics and Econometrics](#)  
[M-WIWI-105414 - Statistics and Econometrics II](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2520022	<a href="#">Financial Econometrics I</a>	2 SWS	Lecture /	Schienle, Buse
WT 24/25	2520023	<a href="#">Übungen zu Financial Econometrics I</a>	2 SWS	Practice /	Schienle, Buse
Exams					
ST 2024	7900223	<a href="#">Financial Econometrics</a>			Schienle
WT 24/25	7900123	<a href="#">Financial Econometrics II</a>			Schienle
WT 24/25	7900126	<a href="#">Financial Econometrics</a>			Schienle

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

**Prerequisites**

None

**Recommendation**

Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics"[2520016]

**Annotation**

The next lecture will take place in the winter semester 2022/23.

Below you will find excerpts from events related to this course:

**Financial Econometrics I**

2520022, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

**Content****Learning objectives:**

The student

- shows a broad knowledge of financial econometric estimation and testing techniques
- is able to apply his/her technical knowledge using software in order to critically assess empirical problems

**Content:**

ARMA, ARIMA, ARFIMA, (non)stationarity, causality, cointegration, ARCH/GARCH, stochastic volatility models, computer based exercises

**Requirements:**

It is recommended to attend the course *Economics III: Introduction to Econometrics* [2520016] prior to this course.

**Workload:**

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

Exam preparation: 40 hours

**Literature**

Taylor, S. J. (2005): "Asset Price Dynamics, Volatility, and Prediction", Princeton University Press.

Tsay, R. S. (2005): "Analysis of Financial Time Series: Financial Econometrics", Wiley, 2nd edition.

Cochrane, J. H. (2005): "Asset Pricing", revised edition, Princeton University Press.

Campbell, J. Y., A. W. Lo, and A. C. MacKinlay (1997): "The Econometrics of Financial Markets", Princeton University Press.

Hamilton, J. D. (1994): "Time Series Analysis", Princeton University Press.

Additional literature will be discussed in the lecture.

T

**8.79 Course: Financial Econometrics II [T-WIWI-110939]**

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101599 - Statistics and Econometrics](#)  
[M-WIWI-105414 - Statistics and Econometrics II](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	3

Events					
ST 2024	2521302	<a href="#">Financial Econometrics II</a>	2 SWS	Lecture / 🗣️	Schienle, Buse
ST 2024	2521303	<a href="#">Übung zu Financial Econometrics II</a>	1 SWS	Practice / 🗣️	Buse, Schienle
Exams					
ST 2024	7900081	<a href="#">Financial Econometrics II</a>			Schienle

Legend: 🗣️ Online, 🗣️🗣️ Blended (On-Site/Online), 🗣️ On-Site, ✕ Cancelled

**Competence Certificate**

Written examination (90 minutes). If the number of participants is low, an oral examination will be held instead.

**Prerequisites**

None

**Recommendation**

Knowledge of the contents covered by the course "Financial Econometrics"

**Annotation**

Course language is English


The next lecture will take place in the summer semester of 2023.





## T

## 8.80 Course: Financial Intermediation [T-WIWI-102623]

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2530232	<a href="#">Financial Intermediation</a>	2 SWS	Lecture / 	Ruckes
WT 24/25	2530233	<a href="#">Übung zu Finanzintermediation</a>	1 SWS	Practice	Ruckes, Benz
Exams					
ST 2024	7900078	<a href="#">Financial Intermediation</a>			Ruckes
WT 24/25	7900063	<a href="#">Financial Intermediation</a>			Ruckes

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins.

The exam is offered each semester.

**Prerequisites**

None

**Recommendation**

None

Below you will find excerpts from events related to this course:

## V

**Financial Intermediation**

2530232, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Organizational issues**

Terminankündigungen des Instituts beachten

**Literature****Weiterführende Literatur:**



- Hartmann-Wendels/Pfingsten/Weber (2014): Bankbetriebslehre, 6. Auflage, Springer Verlag.
- Freixas/Rochet (2008): Microeconomics of Banking, 2. Auflage, MIT Press.





T

**8.81 Course: Financial Management [T-WIWI-102605]**

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101435 - Essentials of Finance](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2024	2530216	<a href="#">Financial Management</a>	2 SWS	Lecture / 	Ruckes
ST 2024	2530217	<a href="#">Übung zu Financial Management</a>	1 SWS	Practice / 	Ruckes
Exams					
ST 2024	7900074	<a href="#">Financial Management</a>			Ruckes
WT 24/25	7900060	<a href="#">Financial Management</a>			Ruckes

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 min.) according to Section 4 (2), 1 of the examination regulation. The exam takes place at every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

**Recommendation**

Knowledge of the content of the course Business Administration: Finance and Accounting [25026/25027] is recommended.

Below you will find excerpts from events related to this course:

V

**Financial Management**

2530216, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Literature****Weiterführende Literatur:**

- Ross, Westerfield, Jaffe, Jordan (2009): Modern Financial Management, McGraw-Hill International Edition
- Berk, De Marzo (2016): Corporate Finance, 4. Edition, Pearson Addison Wesley





## 8.82 Course: FinTech [T-WIWI-112694]

**Responsible:** TT-Prof. Dr. Julian Thimme  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101402 - eFinance](#)  
[M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
WT 24/25	2500032	<a href="#">FinTech</a>	3 SWS	Lecture / Practice (	Thimme
Exams					
ST 2024	7900089	<a href="#">FinTech</a>			Thimme
WT 24/25	7900064	<a href="#">FinTech</a>			Thimme

### Competence Certificate

Written examination (90 minutes) during the lecture-free period of the semester (according to §4(2), 1 SPO).

The examination is offered every semester and can be repeated at any regular examination date.

### Prerequisites

None

### Recommendation

Knowledge of the course Business Administration: Finance and Accounting [25026/25027] is very helpful.

## T

## 8.83 Course: Fluid Power Systems [T-MACH-102093]

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101266 - Automotive Engineering](#)  
[M-MACH-101267 - Mobile Machines](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	2

Events					
WT 24/25	2114093	<a href="#">Fluid Technology</a>	2 SWS	Lecture /	Geimer
Exams					
ST 2024	76-T-MACH-102093	<a href="#">Fluid Power Systems</a>			Geimer
WT 24/25	76-T-MACH-102093	<a href="#">Fluid Power Systems</a>			Geimer

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

The assessment consists of a oral exam taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

### Prerequisites

none

Below you will find excerpts from events related to this course:

## V

### Fluid Technology

2114093, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

In the range of hydrostatics the following topics will be introduced:

- Hydraulic fluids
- Pumps and motors
- Valves
- Accessories
- Hydraulic circuits.

In the range of pneumatics the following topics will be introduced:

- Compressors
- Motors
- Valves
- Pneumatic circuits.
- regular attendance: 21 hours
- self-study: 92 hours

### Literature

Skriptum zur Vorlesung *Fluidtechnik*  
 Institut für Fahrzeugsystemtechnik  
 downloadbar

## T

## 8.84 Course: Foundations of Informatics I [T-WIWI-102749]

**Responsible:** Dr.-Ing. Tobias Käfer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101417 - Foundations of Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	2

Events					
ST 2024	2511010	<a href="#">Foundations of Informatics I</a>	2 SWS	Lecture / 🗣️	Färber, Käfer
ST 2024	2511011	<a href="#">Exercises to Foundations of Informatics I</a>		Practice / 🗣️	Färber, Popovic, Noullet, Käfer, Kinder
Exams					
ST 2024	79AIFB_Info1_B5	<a href="#">Foundations of Informatics I (Registration until 21 July 2024)</a>			Käfer
WT 24/25	79AIFB_Info1_A5	<a href="#">Foundations of Informatics I</a>			Käfer

Legend: 🗣️ Online, 🗣️🗣️ Blended (On-Site/Online), 🗣️ On-Site, ✕ Cancelled

**Competence Certificate**

The assessment consists of an 1h written exam according to Section 4 (2), 1 of the examination regulation.

The exam takes place every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

Below you will find excerpts from events related to this course:

## V

**Foundations of Informatics I**

2511010, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The lecture provides an introduction to basic concepts of computer science and software engineering. Essential theoretical foundations and problem-solving approaches, which are relevant in all areas of computer science, are presented and explained, as well as shown in practical implementations.

The following topics are covered:

- Object Oriented Modeling
- Logic (Propositional Calculus, Predicate Logic, Boolean Algebra)
- Algorithms and Their Properties
- Sort-and Search-Algorithms
- Complexity Theory
- Problem Specification
- Dynamic Data Structures

**Learning objectives:**

The student

- is able to formalise tasks in the domain of informatics and is able to identify solution methods
- knows the basic terminology of computer science and is capable of applying these terms to different problems.
- knows basic programming structures and is able to apply them (particularly simple data structures, object interaction and implementation of basic algorithms).

**Workload:**

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preparation and postprocessing: 67.5 hours
- Exam and exam preparation: 37.5 hours

## Literature

- H. Balzert. Lehrbuch Grundlagen der Informatik. Spektrum Akademischer Verlag 2004.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag 2000.
- T. H. Cormen, C. E. Leiserson. Introduction to Algorithms, MIT Press 2001.



## Exercises to Foundations of Informatics I

2511011, SS 2024, SWS, Language: German, [Open in study portal](#)

Practice (Ü)  
On-Site

## Content

The exercises are related to the lecture Foundations of Informatics I.

Multiple exercises are held that capture the topics, held in the lecture Foundations of Informatics I, and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

The following topics are covered:

- Object Oriented Modeling
- Logic (Propositional Calculus, Predicate Logic, Boolean Algebra)
- Algorithms and Their Properties
- Sort-and Search-Algorithms
- Complexity Theory
- Problem Specification
- Dynamic Data Structures

## Learning objectives:

The student

- is able to formalise tasks in the domain of informatics and is able to identify solution methods
- knows the basic terminology of computer science and is capable of applying these terms to different problems.
- knows basic programming structures and is able to apply them (particularly simple data structures, object interaction and implementation of basic algorithms).

## Literature

- H. Balzert. Lehrbuch Grundlagen der Informatik. Spektrum Akademischer Verlag 2004.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag 2000.
- T. H. Cormen, C. E. Leiserson. Introduction to Algorithms, MIT Press 2001.

**8.85 Course: Foundations of Informatics II [T-WIWI-102707]**

**Responsible:** Prof. Dr. Sanja Lazarova-Molnar  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101417 - Foundations of Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	1

Events					
WT 24/25	2511012	<a href="#">Foundations of Informatics II</a>	3 SWS	Lecture /	Lazarova-Molnar
WT 24/25	2511013	<a href="#">Tutorien zu Grundlagen der Informatik II</a>	1 SWS	Tutorial ( /	Lazarova-Molnar, Götz, Khodadadi
Exams					
ST 2024	7900177	<a href="#">Foundations of Informatics II</a>			Lazarova-Molnar
ST 2024	79AIFB_Info2_A5	<a href="#">Foundations of Informatics II (Registration until 15 July 2024)</a>			Lazarova-Molnar
WT 24/25	79AIFB_Info2	<a href="#">Foundations of Informatics II</a>			Lazarova-Molnar

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam according to Section 4(2), 1 of the examination regulation. The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

**Recommendation**

It is recommended to attend the course "Foundations of Informatics I" beforehand.

Active participation in the practical lessons is strongly recommended.

Below you will find excerpts from events related to this course:

**Foundations of Informatics II**

2511012, WS 24/25, 3 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**  
On-Site

**Content**

The lecture deals with formal models for automata, languages and algorithms as well as real instances of these models, i.e. computer architecture and organization (hardware development, computer arithmetic, architecture models), programming languages (different language levels, from microprogramming to higher programming languages, as well as compiling and execution), operating systems and modes (architecture and properties of operating systems, operating system tasks, client-server systems), data organization and management (types of data organization, primary and secondary organization).

**Learning objectives:**

- Students acquire vast knowledge of methods and concepts in theoretical computer science and computer architectures.
- Based on the acquired knowledge and skills, students are capable of choosing and applying the appropriate methods and concepts for well-defined problem instances.
- Active participation in the tutorials enables students to acquire the necessary knowledge for developing appropriate solutions cooperatively.

**Recommendations:**

It is recommended to attend the course *Foundations of Informatics I* [2511010] beforehand.

Active participation in the practical lessons is strongly recommended.

**Workload:**

The total workload for this course is approximately 150 hours.

**Organizational issues**

Die Vorlesung wird zu Beginn des Semesters 4-stündig und am Ende 2-stündig gelesen, um eine bessere Abdeckung des Inhalts in den Übungen zu gewährleisten.

**Literature**

**Weiterführende Literatur:**

Literatur wird in der Vorlesung bekannt gegeben.

T


## 8.86 Course: Foundations of Interactive Systems [T-WIWI-109816]





**Responsible:** Prof. Dr. Alexander Mädche

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-101434 - eBusiness and Service Management](#)  
[M-WIWI-102752 - Fundamentals of Digital Service Systems](#)  
[M-WIWI-105928 - HR Management & Digital Workplace](#)  
[M-WIWI-105981 - Information Systems & Digital Business](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each summer term	3

Events					
ST 2024	2540560	<a href="#">Foundations of Interactive Systems</a>	3 SWS	Lecture / 	Mädche, Langner
Exams					
ST 2024	7900247	<a href="#">Foundations of Interactive Systems</a>			Mädche
WT 24/25	7900326	<a href="#">Foundations of Interactive Systems</a>			Mädche

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Alternative exam assessment. The assessment is carried out in the form of a one-hour written examination and by carrying out a Capstone project.

Details on the assessment will be announced during the lecture.

### Prerequisites

None

### Recommendation

None

Below you will find excerpts from events related to this course:

V

### Foundations of Interactive Systems

2540560, SS 2024, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
Blended (On-Site/Online)

## Content

### Lecture Description

Computers have evolved from batch processors to highly interactive systems. This offers new possibilities besides challenges for designing a successful interaction between humans and computers. Interactive systems are socio-technical systems in which users perform tasks by interacting with technology in a specific context to achieve specified goals and outcomes.

This lecture introduces key concepts and principles of interactive systems from a human and computer perspective. From a human perspective, we discuss selected individual characteristics, cognitive processes, the interplay between cognition and activity, as well as mental models. From a computer perspective, we introduce established interaction technologies as well as contemporary multimodal technologies (e.g. augmented/mixed reality, eye-based interaction, etc.). We also introduce established principles and guidelines for designing user interfaces. Furthermore, we describe the human-centered design process for interactive systems and supporting techniques & tools (e.g. personas, prototyping, user testing).

With this lecture, students acquire foundational knowledge to successfully **design the interaction between humans and computers** in business and private life. The course is complemented with a **Design Capstone Project**, where students in a team apply design methods & techniques to create an interactive prototype.

### Learning Objectives

The students

- have a basic understanding of key conceptual and theoretical foundations of interactive systems from a human and computer perspective
- are aware of important design principles for the design of important classes of interactive systems
- know design processes and techniques for developing interactive systems
- know how to apply the knowledge and skills gathered in the lecture for a real-world problem (as part of design capstone project)

**Prerequisites:** No specific prerequisites are required for the lecture

**Language of instruction:** English

### Bibliography

Alan Dix, Janet E. Finlay, Gregory D. Abowd, and Russell Beale. 2003. Human-Computer Interaction (3rd Edition). Prentice-Hall, Inc., USA.

Further literature will be made available in the lecture. In case of questions feel free to approach Moritz Langner ([moritz.langner@kit.edu](mailto:moritz.langner@kit.edu))

Die Erfolgskontrolle erfolgt in Form einer Prüfungsleistung anderer Art (Form) nach § 4 Abs. 2 Nr. 3 SPO. Die Leistungskontrolle erfolgt in Form einer einstündigen Klausur und der Durchführung eines Capstone Projektes. Details zur Ausgestaltung der Erfolgskontrolle werden im Rahmen der Vorlesung bekannt gegeben.



**8.87 Course: Foundations of Mobile Business [T-WIWI-104679]**

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	4

Events					
ST 2024	2511226	<a href="#">Foundations of mobile Business</a>	2 SWS	Lecture /	Schiefer, Frister
ST 2024	2511227	<a href="#">Exercises Foundations of mobile Business</a>	1 SWS	Practice /	Schiefer, Frister
Exams					
ST 2024	79AIFB_GMB_C5	<a href="#">Foundations of mobile Business (oral exam)</a>			Oberweis
WT 24/25	79AIFB_GMB_A1	<a href="#">Foundations of Mobile Business</a>			Oberweis

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment of this course is a written (60 min.) or (if necessary) oral examination according to §4(2) of the examination regulation.

**Prerequisites**

None

**Annotation**

Lecture and exercises are integrated.

Below you will find excerpts from events related to this course:

**Foundations of mobile Business**

2511226, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The lecture covers the basics of mobile business with a focus on (information) technical basics. These are interlinked with the economic background in Germany.

Contents are:

1. organizational matters
2. introduction & definitions
3. mobile devices
4. mobile radio technologies
5. mobile communications market
6. mobile applications
7. digital radio technologies
8. location & context

Note: The teaching units listed above each have a different scope.

**Learning objectives:**

If you are confronted with a question in your job which affects "Mobile Business", you should be able to provide answers quickly and competently:

Market structures  
 technique  
 Possibilities for applications  
 lawsuits  
 issues

**Workload:**

The total workload for this course unit is approx. 135 hours (4.5 credit points).

**Organizational issues**

Vorlesung und Übung werden integriert angeboten.

**Literature**

- Jochen Schiller: Mobilkommunikation (2. Aufl. 2003)  
[http://www.mi.fu-berlin.de/inf/groups/ag-tech/teaching/resources/Mobile\\_Communications/course\\_Material/index.html](http://www.mi.fu-berlin.de/inf/groups/ag-tech/teaching/resources/Mobile_Communications/course_Material/index.html)
- Martin Sauter: Grundkurs Mobile Kommunikationssysteme (6. Aufl. 2015)  
<http://link.springer.com/book/10.1007%2F978-3-658-08342-7>
- Küpper, A.: Location-based Services. Fundamentals and Operation. Wiley & Sons, 2005.
- Roth, J.: Mobile Computing. Grundlagen, Technik, Konzepte. Dpunkt.verlag, 2. Auflage, 2005.
- Mansfeld, W.: Satellitenortung und Navigation:  
Grundlagen, Wirkungsweise und Anwendung globaler Satellitennavigationssysteme
- Dodel, H., Häupler, D.: Satellitennavigation

**Einige relevante Informationen im Web**

- Bundesnetzagentur <http://www.bundesnetzagentur.de>  
u.a. Jahresbericht und Marktbeobachtung
- VATM-Marktstudien  
<http://www.vatm.de/vatm-marktstudien.html>
- Verbände, bspw. BITKOM ([bitkom.org](http://bitkom.org)), eco e.V. ([eco.de](http://eco.de))
- Presse, bspw. Teltarif, Heise, Golem, ...
- Statistiken (Statista Lizenz des KIT)

T


## 8.88 Course: Fuels and Lubricants for Combustion Engines [T-MACH-105184]





**Responsible:** Hon.-Prof. Dr. Bernhard Ulrich Kehrwald  
Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2133108	<a href="#">Fuels and Lubricants for Combustion Engines</a>	2 SWS	Lecture / 	Kehrwald
Exams					
ST 2024	76-T-MACH-105184	<a href="#">Fuels and Lubricants for Combustion Engines</a>			Kehrwald

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

oral examination, Duration: ca. 25 min., no auxiliary means

### Prerequisites

none

Below you will find excerpts from events related to this course:

V

### Fuels and Lubricants for Combustion Engines

2133108, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

electric drives and fuel cell drives with the associated operating materials will also be presented

- Introduction, basics, primary energy and energy chains
- Illustrative chemistry of hydrocarbons
- Fossil fuels, exploration, processing, standards
- Operating materials not fossil, renewable, alternative
- Fuels, lubricants, coolants, AdBlue
- Laboratory analysis, testing, test benches and measurement technology
- Excursion to test fields for motorized drives from 0.5 to 3,500 kW

### Literature

Skript

T


**8.89 Course: Functional Ceramics [T-MACH-105179]**





**Responsible:** Dr. Manuel Hinterstein  
Dr.-Ing. Wolfgang Rheinheimer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2126784	<a href="#">Functional Ceramics</a>	2 SWS	Lecture / 	Botros
Exams					
ST 2024	76-T-MACH-105179	<a href="#">Functional Ceramics</a>			Hinterstein
WT 24/25	76T-MACH-105179	<a href="#">Functional Ceramics</a>			Hinterstein

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment consists of an oral exam (20 min) taking place at the agreed date.

Auxiliary means: none

The re-examination is offered upon agreement.

**Prerequisites**

none

**T** **8.90 Course: Fundamentals for Design of Motor-Vehicle Bodies I [T-MACH-102116]**

**Responsible:** Dipl.-Ing. Horst Dietmar Bardehle  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101266 - Automotive Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	1,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2113814	<a href="#">Fundamentals for Design of Motor-Vehicles Bodies I</a>	1 SWS	Lecture /	Bardehle
Exams					
ST 2024	76-T-MACH-102116	<a href="#">Fundamentals for Design of Motor-Vehicle Bodies I</a>			Bardehle, Unrau
WT 24/25	76-T-MACH-102116	<a href="#">Fundamentals for Design of Motor-Vehicle Bodies I</a>			Bardehle

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Oral group examination

Duration: 30 minutes

Auxiliary means: none

**Prerequisites**

none

Below you will find excerpts from events related to this course:

V

**Fundamentals for Design of Motor-Vehicles Bodies I**

2113814, WS 24/25, 1 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**  
**On-Site**

**Content**

1. History and design
2. Aerodynamics
3. Design methods (CAD/CAM, FEM)
4. Manufacturing methods of body parts
5. Fastening technologie
6. Body in white / body production, body surface

**Learning Objectives:**

The students have an overview of the fundamental possibilities for design and manufacture of motor-vehicle bodies. They know the complete process, from the first idea, through the concept to the dimensioned drawings (e.g. with FE-methods). They have knowledge about the fundamentals and their correlations, to be able to analyze and to judge relating components as well as to develop them accordingly.

**Organizational issues**

Das Vorlesungsmaterial wird auf ILIAS bereitgestellt. Das ILIAS-Passwort erhalten Sie unter <https://fast-web-01.fast.kit.edu/PasswoerterIlIAS/>

Termine und nähere Informationen: siehe ILIAS oder Institutshomepage

Dates and further information will be published on the homepage of the institute

**Literature**

1. Automobiltechnische Zeitschrift ATZ, Friedr. Vieweg & Sohn Verlagsges. mbH, Wiesbaden
2. Automobil Revue, Bern (Schweiz)
3. Automobil Produktion, Verlag Moderne Industrie, Landsberg

**T 8.91 Course: Fundamentals for Design of Motor-Vehicle Bodies II [T-MACH-102119]**

**Responsible:** Dipl.-Ing. Horst Dietmar Bardehle  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101266 - Automotive Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	1,5	Grade to a third	Each summer term	1

Events					
ST 2024	2114840	<a href="#">Fundamentals for Design of Motor-Vehicles Bodies II</a>	1 SWS	Lecture / 🗣️	Bardehle
Exams					
ST 2024	76-T-MACH-102119	<a href="#">Fundamentals for Design of Motor-Vehicle Bodies II</a>			Bardehle, Gauterin
WT 24/25	76-T-MACH-102119	<a href="#">Fundamentals for Design of Motor-Vehicle Bodies II</a>			Bardehle

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✖ Canceled

**Competence Certificate**

Oral group examination

Duration: 30 minutes

Auxiliary means: none

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**V Fundamentals for Design of Motor-Vehicles Bodies II** Lecture (V)  
On-Site  
 2114840, SS 2024, 1 SWS, Language: German, [Open in study portal](#)

**Content**

1. Body properties/testing procedures
2. External body-parts
3. Interior trim
4. Compartment air conditioning
5. Electric and electronic features
6. Crash tests
7. Project management aspects, future prospects

**Learning Objectives:**

The students know that, often the design of seemingly simple detail components can result in the solution of complex problems. They have knowledge in testing procedures of body properties. They have an overview of body parts such as bumpers, window lift mechanism and seats. They understand, as well as, parallel to the normal electrical system, about the electronic side of a motor vehicle. Based on this they are ready to analyze and to judge the relation of these single components. They are also able to contribute competently to complex development tasks by imparted knowledge in project management.

**Organizational issues**

Voraussichtliche Termine, nähere Informationen und evtl. Änderungen:

siehe Institutshomepage.

Scheduled dates, further Information and possible changes of date:

see homepage of the institute.

**Literature**

1. Automobiltechnische Zeitschrift ATZ, Friedr. Vieweg & Sohn Verlagsges. mbH, Wiesbaden
2. Automobil Revue, Bern (Schweiz)
3. Automobil Produktion, Verlag Moderne Industrie, Landsberg



**8.92 Course: Fundamentals in the Development of Commercial Vehicles [T-MACH-111389]****Responsible:** Christof Weber**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101265 - Vehicle Development](#)  
[M-MACH-101267 - Mobile Machines](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	3	Grade to a third	see Annotations	2 terms	2

Events					
ST 2024	2114844	<a href="#">Fundamentals in the Development of Commercial Vehicles II</a>	1 SWS	Lecture /	Weber
WT 24/25	2113812	<a href="#">Fundamentals in the Development of Commercial Vehicles I</a>	1 SWS	Lecture /	Weber
Exams					
ST 2024	76T-MACH-111389	<a href="#">Fundamentals in the Development of Commercial Vehicles</a>			Weber
WT 24/25	76T-MACH-111389	<a href="#">Fundamentals in the Development of Commercial Vehicles</a>			Weber

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Oral group examination

Duration: appr. 30 minutes

Auxiliary means: none

**Prerequisites**

none

**Annotation**

Fundamentals in the Development of Commercial Vehicles I, WT

Fundamentals in the Development of Commercial Vehicles II, ST

Below you will find excerpts from events related to this course:

**Fundamentals in the Development of Commercial Vehicles II**2114844, SS 2024, 1 SWS, Language: German, [Open in study portal](#)Lecture (V)  
On-Site**Content**

1. Gear boxes of commercial vehicles
2. Intermediate elements of the drive train
3. Axle systems
4. Front axles and driving dynamics
5. Chassis and axle suspension
6. Braking System
7. Systems
8. Excursion

**Learning Objectives:**

The students know the advantages and disadvantages of different drives. Furthermore they are familiar with components, such as transfer box, propeller shaft, powered and non-powered frontaxle etc. Beside other mechanical components, such as chassis, axle suspension and braking system, also electric and electronic systems are known. Consequently the student are able to analyze and to judge the general concepts as well as to adjust them precisely with the area of application.

**Organizational issues**

Genaue Termine sowie nähere Informationen und eventuelle Terminänderungen:

siehe Institutshomepage.

**Literature**

1. HILGERS, M.: Nutzfahrzeugtechnik lernen, Springer Vieweg, ISSN: 2510-1803
2. SCHITTLER, M.; HEINRICH, R.; KERSCHBAUM, W.: Mercedes-Benz Baureihe 500 – neue V-Motorengeneration für schwere Nutzfahrzeuge, MTZ 57 Nr. 9, S. 460 ff, 1996
3. Robert Bosch GmbH (Hrsg.): Bremsanlagen für Kraftfahrzeuge, VDI-Verlag, Düsseldorf, 1. Auflage, 1994
4. RUBI, V.; STRIFLER, P. (Hrsg. Institut für Kraftfahrwesen RWTH Aachen): Industrielle Nutzfahrzeugentwicklung, Schriftenreihe Automobiltechnik, 1993
5. TEUTSCH, R.; CHERUTI, R.; GASSER, R.; PEREIRA, M.; de SOUZA, A.; WEBER, C.: Fuel Efficiency Optimization of Market Specific Truck Applications, Proceedings of the 5th Commercial Vehicle Technology Symposium – CVT 2018

**Fundamentals in the Development of Commercial Vehicles I**

2113812, WS 24/25, 1 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

1. Introduction, definitions, history
2. Development tools
3. Complete vehicle
4. Cab, bodyshell work
5. Cab, interior fitting
6. Alternative drive systems
7. Drive train
8. Drive system diesel engine
9. Intercooled diesel engines

**Learning Objectives:**

The students have proper knowledge about the process of commercial vehicle development starting from the concept and the underlying original idea to the real design. They know that the customer requirements, the technical realisability, the functionality and the economy are important drivers.

The students are able to develop parts and components. Furthermore they have knowledge about different cab concepts, the interior and the interior design process. Consequently they are ready to analyze and to judge concepts of commercial vehicles as well as to participate competently in the commercial vehicle development.

**Organizational issues**

Das Vorlesungsmaterial wird auf ILIAS bereitgestellt. Das ILIAS-Passwort erhalten Sie unter <https://fast-web-01.fast.kit.edu/PasswoerterIlias/>

Termine und Nähere Informationen: siehe ILIAS oder Institutshomepage

Dates and further information will be published on the homepage of the institute.

**Literature**

1. Marwitz, H., Zittel, S.: ACTROS -- die neue schwere Lastwagenbaureihe von Mercedes-Benz, ATZ 98, 1996, Nr. 9
2. Alber, P., McKellip, S.: ACTROS -- Optimierte passive Sicherheit, ATZ 98, 1996
3. Morschheuser, K.: Airbag im Rahmenfahrzeug, ATZ 97, 1995, S. 450 ff.

**T** **8.93 Course: Fundamentals of Automobile Development I [T-MACH-105162]**

**Responsible:** Dr. Manfred Harrer  
**Organisation:** KIT Department of Mechanical Engineering  
**Part of:** [M-MACH-101265 - Vehicle Development](#)

<b>Type</b> Written examination	<b>Credits</b> 1,5	<b>Grading scale</b> Grade to a third	<b>Recurrence</b> Each winter term	<b>Version</b> 1
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Events					
WT 24/25	2113810	<a href="#">Fundamentals of Automobile Development I</a>	1 SWS	Lecture /	Harrer
WT 24/25	2113851	<a href="#">Principles of Whole Vehicle Engineering I</a>	1 SWS	Lecture /	Harrer
Exams					
ST 2024	76-T-MACH-105162	<a href="#">Fundamentals of Automobile Development I</a>			Frech, Gießler

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**  
Written examination

Duration: 90 minutes  
 Auxiliary means: none

**Prerequisites**  
none

Below you will find excerpts from events related to this course:

**V** **Fundamentals of Automobile Development I** **Lecture (V)**  
**On-Site**  
 2113810, WS 24/25, 1 SWS, Language: German, [Open in study portal](#)

**Content**

1. Process of automobile development
2. Conceptual dimensioning and design of an automobile
3. Laws and regulations – National and international boundary conditions
4. Aero dynamical dimensioning and design of an automobile I
5. Aero dynamical dimensioning and design of an automobile II
6. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines I
7. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines II

**Learning Objectives:**

The students have an overview of the fundamentals of the development of automobiles. They know the development process, the national and the international legal requirements that are to be met. They have knowledge about the thermo-management, aerodynamics and the design of an automobile. They are ready to judge goal conflicts in the field of automobile development and to work out approaches to solving a problem.

**Organizational issues**

Das Vorlesungsmaterial wird auf ILIAS bereitgestellt. Das ILIAS-Passwort erhalten Sie unter <https://fast-web-01.fast.kit.edu/PasswoerterIlias/>

Termine und nähere Informationen finden Sie auf der Institutshomepage.  
 Kann nicht mit Lehrveranstaltung 2113851 kombiniert werden.  
 Date and further information will be published on the homepage of the institute.  
 Cannot be combined with lecture 2113851.

**Literature**

Skript zur Vorlesung wird zu Beginn des Semesters ausgegeben

The scriptum will be provided during the first lessons

**Principles of Whole Vehicle Engineering I**

2113851, WS 24/25, 1 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

1. Process of automobile development
2. Conceptual dimensioning and design of an automobile
3. Laws and regulations – National and international boundary conditions
4. Aero dynamical dimensioning and design of an automobile I
5. Aero dynamical dimensioning and design of an automobile II
6. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines I
7. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines II

**Learning Objectives:**

The students have an overview of the fundamentals of the development of automobiles. They know the development process, the national and the international legal requirements that are to be met. They have knowledge about the thermo-management, aerodynamics and the design of an automobile. They are ready to judge goal conflicts in the field of automobile development and to work out approaches to solving a problem.

**Organizational issues**

You will find the lecture material on ILIAS. To get the ILIAS password, KIT students refer to <https://fast-web-01.fast.kit.edu/PasswoerterIlias/>

Termine und nähere Informationen finden Sie auf der Institutshomepage.

Dats and further information will be published on the homepage of the institute.

Kann nicht mit Lehrveranstaltung 2113810 kombiniert werden

Cannot be combined with lecture 2113810.

**Literature**

Skript zur Vorlesung wird zu Beginn des Semesters ausgegeben

The scriptum will be provided during the first lessons

**8.94 Course: Fundamentals of Automobile Development II [T-MACH-105163]****Responsible:** Dr. Manfred Harrer**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101265 - Vehicle Development](#)**Type**  
Written examination**Credits**  
1,5**Grading scale**  
Grade to a third**Recurrence**  
Each summer term**Version**  
2

Events					
ST 2024	2114842	<a href="#">Principles of Whole Vehicle Engineering II</a>	1 SWS	Block /	Frech
ST 2024	2114860	<a href="#">Principles of Whole Vehicle Engineering II</a>	1 SWS	/	Frech
Exams					
ST 2024	76-T-MACH-105163	<a href="#">Fundamentals of Automobile Development II</a>			Frech, Gießler

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Written examination

Duration: 90 minutes

Auxiliary means: none

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**Principles of Whole Vehicle Engineering II**2114842, SS 2024, 1 SWS, Language: German, [Open in study portal](#)**Block (B)**  
**On-Site****Content**

1. Application-oriented material and production technology I
2. Application-oriented material and production technology II
3. Overall vehicle acoustics in the automobile development
4. Drive train acoustics in the automobile development
5. Testing of the complete vehicle
6. Properties of the complete automobile

**Learning Objectives:**

The students are familiar with the selection of appropriate materials and the choice of adequate production technology. They have knowledge of the acoustical properties of the automobiles, covering both the interior sound and exterior noise. They have an overview of the testing procedures of the automobiles. They know in detail the evaluation of the properties of the complete automobile. They are ready to participate competently in the development process of the complete vehicle.

**Organizational issues**

Vorlesung findet als Blockvorlesung an folgenden Terminen statt: 02.05., 16.05., 06.06. 2024, jeweils von 08:00 bis 11:00 Uhr.

Die Vorlesung findet im Sommersemester 2024 zum letzten Mal statt.

Kann nicht mit der Veranstaltung [2114860] kombiniert werden.

Cannot be combined with lecture [2114860].

**Literature**

Skript zur Vorlesung ist über ILIAS verfügbar.



## Principles of Whole Vehicle Engineering II

2114860, SS 2024, 1 SWS, Language: English, [Open in study portal](#)

On-Site

### Content

1. Application-oriented material and production technology I
2. Application-oriented material and production technology II
3. Overall vehicle acoustics in the automobile development
4. Drive train acoustics in the automobile development
5. Testing of the complete vehicle
6. Properties of the complete automobile

### Learning Objectives:

The students are familiar with the selection of appropriate materials and the choice of adequate production technology. They have knowledge of the acoustical properties of the automobiles, covering both the interior sound and exterior noise. They have an overview of the testing procedures of the automobiles. They know in detail the evaluation of the properties of the complete automobile. They are ready to participate competently in the development process of the complete vehicle.

### Organizational issues

Veranstaltung findet als Blockvorlesung an folgenden Terminen statt: 02.05., 16.05., 06.06.2024 von 11:15 bis 14:00 Uhr.

### Scheduled dates:

see homepage of the institute.

The lecture will be offered for the last time in summer semester 2024!

Kann nicht mit der Veranstaltung [2114842] kombiniert werden.

Cannot be combined with lecture [2114842].

### Literature

Das Skript zur Vorlesung ist über ILIAS verfügbar.

T


## 8.95 Course: Fundamentals of Catalytic Exhaust Gas Aftertreatment [T-MACH-105044]




**Responsible:** Prof. Dr. Olaf Deutschmann  
 Prof. Dr. Jan-Dierk Grunwaldt  
 Dr.-Ing. Heiko Kubach  
 Hon.-Prof. Dr. Egbert Lox

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	1

Events					
ST 2024	2134138	<a href="#">Fundamentals of catalytic exhaust gas aftertreatment</a>	2 SWS	Lecture / 	Lox, Grunwaldt, Deutschmann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

oral examination, Duration: 25 min., no auxiliary means

### Prerequisites

none

Below you will find excerpts from events related to this course:

V

### Fundamentals of catalytic exhaust gas aftertreatment

2134138, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Organizational issues



Blockvorlesung, Termin und Ort werden auf Ilias sowie der Homepage des IFKM und ITCP bekannt gegeben.





T

## 8.96 Course: Fundamentals of Production Management [T-WIWI-102606]

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101437 - Industrial Production I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5,5	Grade to a third	Each summer term	1

Events					
ST 2024	2581950	<a href="#">Fundamentals of Production Management</a>	2 SWS	Lecture / 	Schultmann
ST 2024	2581951	<a href="#">Übungen Grundlagen der Produktionswirtschaft</a>	2 SWS	Practice / 	Braun
Exams					
ST 2024	7981950	<a href="#">Fundamentals of Production Management</a>			Schultmann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment consists of a written exam (90 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

**Prerequisites**

None

Below you will find excerpts from events related to this course:

V

**Fundamentals of Production Management**

2581950, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

This lecture focuses on strategic production management with respect to various economic aspects. Interdisciplinary approaches of systems theory will be used to describe the challenges of industrial production. This course will emphasize the importance of R&D as the central step in strategic corporate planning to ensure future long-term success. In the field of site selection and planning for firms and factories, attention will be drawn upon individual aspects of existing and greenfield sites as well as existing distribution and supply centres. Students will obtain knowledge in solving internal and external transport and storage problems.

**Organizational issues**

Blockveranstaltung, siehe Institutsaushang

**Literature**

Wird in der Veranstaltung bekannt gegeben.



**T 8.97 Course: Gear Cutting Technology [T-MACH-102148]**

**Responsible:** Hon.-Prof. Dr. Markus Klaiber  
**Organisation:** KIT Department of Mechanical Engineering  
**Part of:** [M-MACH-101265 - Vehicle Development](#)  
[M-MACH-106590 - Production Engineering](#)

<b>Type</b> Oral examination	<b>Credits</b> 4	<b>Grading scale</b> Grade to a third	<b>Recurrence</b> Each winter term	<b>Version</b> 1
---------------------------------	---------------------	------------------------------------------	---------------------------------------	---------------------

Events					
WT 24/25	2149655	<a href="#">Gear Technology</a>	2 SWS	Lecture /	Klaiber
Exams					
WT 24/25	76-T-MACH-102148	<a href="#">Gear Technology</a>			Klaiber

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**  
Oral Exam (20 min)

**Prerequisites**  
none

Below you will find excerpts from events related to this course:

V

**Gear Technology**

2149655, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**  
**On-Site**

**Content**

Based on the gearing theory, manufacturing processes and machine technologies for producing gearings, the needs of modern gear manufacturing will be discussed in the lecture. For this purpose, various processes for various gear types are taught which represent the state of the art in practice today. A classification in soft and hard machining and furthermore in cutting and non-cutting technologies will be made. For comprehensive understanding the processes, machine technologies, tools and applications of the manufacturing of gearings will be introduced and the current developments presented. For assessment and classification of the applications and the performance of the technologies, the methods of mass production and manufacturing defects will be discussed. Sample parts, reports from current developments in the field of research and an excursion to a gear manufacturing company round out the lecture.

**Learning Outcomes:**

The students ...

- can describe the basic terms of gearings and are able to explain the imparted basics of the gearwheel and gearing theory.
- are able to specify the different manufacturing processes and machine technologies for producing gearings. Furthermore they are able to explain the functional principles and the dis-/advantages of these manufacturing processes.
- can apply the basics of the gearing theory and manufacturing processes on new problems.
- are able to read and interpret measuring records for gearings. are able to make an appropriate selection of a process based on a given application
- can describe the entire process chain for the production of toothed components and their respective influence on the resulting workpiece properties.

**Workload:**

regular attendance: 21 hours  
self-study: 99 hours

**Literature**

**Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**



Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).


T

## 8.98 Course: Geological Hazards and Risk [T-PHYS-103525]

**Responsible:** Dr. Andreas Schäfer**Organisation:** KIT Department of Physics**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	8	Grade to a third	Each winter term	2

Events					
WT 24/25	4060121	<a href="#">Geological Hazards and Risk</a>	2 SWS	Lecture / 	Schäfer, Rietbrock
WT 24/25	4060122	<a href="#">Exercises on Geological Hazards and Risk</a>	2 SWS	Practice / 	Schäfer, Rietbrock


Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled




T

## 8.99 Course: Global Optimization I [T-WIWI-102726]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101413 - Applications of Operations Research](#)  
[M-WIWI-101414 - Methodical Foundations of OR](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2024	2550134	<a href="#">Global Optimization I</a>	2 SWS	Lecture / 	Stein
Exams					
ST 2024	7900205_SS2024_HK	<a href="#">Global Optimization I</a>			Stein
WT 24/25	7900004_WS2425_NK	<a href="#">Global Optimization I</a>			Stein

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Success is in the form of a written examination (60 min.) (according to § 4(2), 1 SPO). The successful completion of the exercises is required for admission to the written exam.

The exam is offered in the lecture of semester and the following semester.

The success check can be done also with the success control for "Global optimization II". In this case, the duration of the written exam is 120 min.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from events related to this course:

V

**Global Optimization I**

2550134, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

In many optimization problems from economics, engineering and natural sciences, solution algorithms are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

The lecture treats methods for global optimization of convex functions under convex constraints. It is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- Optimality in convex optimization
- Duality, bounds, and constraint qualifications
- Algorithms (Kelley's cutting plane method, Frank-Wolfe method, primal-dual interior point methods)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of *nonconvex* optimization problems forms the contents of the lecture "Global Optimization II". The lectures "Global Optimization I" and "Global Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands the fundamentals of deterministic global optimization in the convex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the convex case in practice.

**Literature**

O. Stein, Grundzüge der Globalen Optimierung, SpringerSpektrum, 2018.

**Weiterführende Literatur:**

- W. Alt, Numerische Verfahren der konvexen, nichtglatten Optimierung, Teubner, 2004
- C.A. Floudas, Deterministic Global Optimization, Kluwer, 2000
- R. Horst, H. Tuy, Global Optimization, Springer, 1996
- A. Neumaier, Interval Methods for Systems of Equations, Cambridge University Press, 1990

T

## 8.100 Course: Global Optimization I and II [T-WIWI-103638]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	Each summer term	1

Events					
ST 2024	2550134	<a href="#">Global Optimization I</a>	2 SWS	Lecture /	Stein
ST 2024	2550135	<a href="#">Exercise to Global Optimization I and II</a>	2 SWS	Practice /	Stein, Beck
ST 2024	2550136	<a href="#">Global Optimization II</a>	2 SWS	Lecture /	Stein
Exams					
ST 2024	7900207_SS2024_HK	<a href="#">Global Optimization I and II</a>			Stein
WT 24/25	7900006_WS2425_NK	<a href="#">Global Optimization I and II</a>			Stein

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment of the lecture is a written examination (120 minutes) according to §4(2), 1 of the examination regulation. The successful completion of the exercises is required for admission to the written exam.

The examination is held in the semester of the lecture and in the following semester.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from events related to this course:

V

**Global Optimization I**

2550134, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

In many optimization problems from economics, engineering and natural sciences, solution algorithms are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

The lecture treats methods for global optimization of convex functions under convex constraints. It is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- Optimality in convex optimization
- Duality, bounds, and constraint qualifications
- Algorithms (Kelley's cutting plane method, Frank-Wolfe method, primal-dual interior point methods)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of *nonconvex* optimization problems forms the contents of the lecture "Global Optimization II". The lectures "Global Optimization I" and "Global Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands the fundamentals of deterministic global optimization in the convex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the convex case in practice.

**Literature**

O. Stein, Grundzüge der Globalen Optimierung, SpringerSpektrum, 2018.

**Weiterführende Literatur:**

- W. Alt, Numerische Verfahren der konvexen, nichtglatten Optimierung, Teubner, 2004
- C.A. Floudas, Deterministic Global Optimization, Kluwer, 2000
- R. Horst, H. Tuy, Global Optimization, Springer, 1996
- A. Neumaier, Interval Methods for Systems of Equations, Cambridge University Press, 1990

**Global Optimization II**

2550136, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

In many optimization problems from economics, engineering and natural sciences, solution algorithms are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

The lecture treats methods for global optimization of nonconvex functions under nonconvex constraints. It is structured as follows:

- Introduction and examples
- Convex relaxation
- Interval arithmetic
- Convex relaxation via alphaBB method
- Branch-and-bound methods
- Lipschitz optimization

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of *convex* optimization problems forms the contents of the lecture "Global Optimization I". The lectures "Global Optimization I" and "Global Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands the fundamentals of deterministic global optimization in the nonconvex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the nonconvex case in practice.

**Literature**

O. Stein, Grundzüge der Globalen Optimierung, SpringerSpektrum, 2018.

**Weiterführende Literatur:**

- W. Alt, Numerische Verfahren der konvexen, nichtglatten Optimierung, Teubner, 2004
- C.A. Floudas, Deterministic Global Optimization, Kluwer, 2000
- R. Horst, H. Tuy, Global Optimization, Springer, 1996
- A. Neumaier, Interval Methods for Systems of Equations, Cambridge University Press, 1990





T

## 8.101 Course: Global Optimization II [T-WIWI-102727]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2024	2550136	<a href="#">Global Optimization II</a>	2 SWS	Lecture / 	Stein
Exams					
ST 2024	7900206_SS2024_HK	<a href="#">Global Optimization II</a>			Stein
WT 24/25	7900005_WS2425_NK	<a href="#">Global Optimization II</a>			Stein

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation. The successful completion of the exercises is required for admission to the written exam.

The examination is held in the semester of the lecture and in the following semester.

The examination can also be combined with the examination of "Global optimization I". In this case, the duration of the written examination takes 120 minutes.

**Prerequisites**

None

**Annotation**

Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from events related to this course:

V

**Global Optimization II**

2550136, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

In many optimization problems from economics, engineering and natural sciences, solution algorithms are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

The lecture treats methods for global optimization of nonconvex functions under nonconvex constraints. It is structured as follows:

- Introduction and examples
- Convex relaxation
- Interval arithmetic
- Convex relaxation via alphaBB method
- Branch-and-bound methods
- Lipschitz optimization

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of *convex* optimization problems forms the contents of the lecture "Global Optimization I". The lectures "Global Optimization I" and "Global Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands the fundamentals of deterministic global optimization in the nonconvex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the nonconvex case in practice.

**Literature**

O. Stein, Grundzüge der Globalen Optimierung, SpringerSpektrum, 2018.

**Weiterführende Literatur:**

- W. Alt, Numerische Verfahren der konvexen, nichtglatten Optimierung, Teubner, 2004
- C.A. Floudas, Deterministic Global Optimization, Kluwer, 2000
- R. Horst, H. Tuy, Global Optimization, Springer, 1996
- A. Neumaier, Interval Methods for Systems of Equations, Cambridge University Press, 1990

T

**8.102 Course: Global Production [T-MACH-113832]****Responsible:** Prof. Dr.-Ing. Gisela Lanza**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	1

**Competence Certificate**

Written Exam (60 min)

**Prerequisites**

T-MACH-108848 - Globale Produktion und Logistik - Teil 1: Globale Produktion must not be commenced.

T-MACH-105158 - Globale Produktion und Logistik - Teil 1: Globale Produktion must not be commenced.

T-MACH-110337 - Globale Produktion und Logistik must not be commenced.

T

**8.103 Course: Handling Characteristics of Motor Vehicles I [T-MACH-105152]**

**Responsible:** Dr.-Ing. Hans-Joachim Unrau  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101264 - Handling Characteristics of Motor Vehicles](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each winter term	1

Events					
WT 24/25	2113807	<a href="#">Handling Characteristics of Motor Vehicles I</a>	2 SWS	Lecture /	Unrau
Exams					
ST 2024	76-T-MACH-105152	<a href="#">Handling Characteristics of Motor Vehicles I</a>			Unrau
WT 24/25	76-T-MACH-105152	<a href="#">Handling Characteristics of Motor Vehicles I</a>			Unrau

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Verbally

Duration: 30 up to 40 minutes

Auxiliary means: none

**Prerequisites**

none

Below you will find excerpts from events related to this course:

V

**Handling Characteristics of Motor Vehicles I**

2113807, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
Online

**Content**

1. Problem definition: Control loop driver - vehicle - environment (e.g. coordinate systems, modes of motion of the car body and the wheels)

2. Simulation models: Creation from motion equations (method according to D'Alembert, method according to Lagrange, programme packages for automatically producing of simulation equations), model for handling characteristics (task, motion equations)

3. Tyre behavior: Basics, dry, wet and winter-smooth roadway

Learning Objectives:

The students know the basic connections between drivers, vehicles and environment. They can build up a vehicle simulation model, with which forces of inertia, aerodynamic forces and tyre forces as well as the appropriate moments are considered. They have proper knowledge in the area of tyre characteristics, since a special meaning comes to the tire behavior during driving dynamics simulation. Consequently they are ready to analyze the most important influencing factors on the driving behaviour and to contribute to the optimization of the handling characteristics.

**Organizational issues**

Die Vorlesung wird als Videostream zur Verfügung gestellt. Sie finden den Videostream und das Vorlesungsmaterial auf ILIAS. Das ILIAS-Passwort erhalten Sie unter <https://fast-web-01.fast.kit.edu/PasswoerterIlias/>

**Literature**

1. Willumeit, H.-P.: Modelle und Modellierungsverfahren in der Fahrzeugdynamik, B. G. Teubner Verlag, 1998
2. Mitschke, M./Wallentowitz, H.: Dynamik von Kraftfahrzeugen, Springer-Verlag, Berlin, 2004
3. Gnadler, R.; Unrau, H.-J.: Umdrucksammlung zur Vorlesung Fahreigenschaften von Kraftfahrzeugen I

**T 8.104 Course: Handling Characteristics of Motor Vehicles II [T-MACH-105153]**

**Responsible:** Dr.-Ing. Hans-Joachim Unrau  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101264 - Handling Characteristics of Motor Vehicles](#)

<b>Type</b> Oral examination	<b>Credits</b> 3	<b>Grading scale</b> Grade to a third	<b>Recurrence</b> Each summer term	<b>Version</b> 1
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Events					
ST 2024	2114838	<a href="#">Handling Characteristics of Motor Vehicles II</a>	2 SWS	Lecture / 📱	Unrau
Exams					
ST 2024	76-T-MACH-105153	<a href="#">Handling Characteristics of Motor Vehicles II</a>			Unrau
WT 24/25	76-T-MACH-105153	<a href="#">Handling Characteristics of Motor Vehicles II</a>			Unrau

Legend: 📱 Online, 🔄 Blended (On-Site/Online), 📍 On-Site, ✖ Cancelled

**Competence Certificate**

Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

**Prerequisites**

none

Below you will find excerpts from events related to this course:

V

**Handling Characteristics of Motor Vehicles II**

2114838, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**  
Online

**Content**

1. Vehicle handling: Bases, steady state cornering, steering input step, single sine, double track switching, slalom, cross-wind behavior, uneven roadway

2. stability behavior: Basics, stability conditions for single vehicles and for vehicles with trailer

**Learning Objectives:**

The students have an overview of common test methods, with which the handling of vehicles is gauged. They are able to interpret results of different stationary and transient testing methods. Apart from the methods, with which e.g. the driveability in curves or the transient behaviour from vehicles can be registered, also the influences from cross-wind and from uneven roadways on the handling characteristics are well known. They are familiar with the stability behavior from single vehicles and from vehicles with trailer. Consequently they are ready to judge the driving behaviour of vehicles and to change it by specific vehicle modifications.

**Organizational issues**

Die Vorlesung wird als Videostream zur Verfügung gestellt. Sie finden den Videostream und das Vorlesungsmaterial auf ILIAS. Das ILIAS-Passwort erhalten Sie unter <https://fast-web-01.fast.kit.edu/PasswoerterIlias/>


**Literature**




- Zomotor, A.: Fahrwerktechnik: Fahrverhalten, Vogel Verlag, 1991
- Mitschke, M./Wallentowitz, H.: Dynamik von Kraftfahrzeugen, Springer-Verlag, Berlin, 2004
- Gnadler, R.; Unrau, H.-J.: Umdrucksammlung zur Vorlesung Fahreigenschaften von Kraftfahrzeugen II

T

## 8.105 Course: High Performance Powder Metallurgy Materials [T-MACH-102157]

**Responsible:** apl. Prof. Dr. Günter Schell**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)**Type**  
Oral examination**Credits**  
4**Grading scale**  
Grade to a third**Recurrence**  
Each summer term**Version**  
1

Events					
ST 2024	2126749	<a href="#">Advanced powder metals</a>	2 SWS	Lecture / 	Schell
Exams					
ST 2024	76-T-MACH-102157	<a href="#">High Performance Powder Metallurgy Materials</a>			Schell
WT 24/25	76-T-MACH-102157	<a href="#">High Performance Powder Metallurgy Materials</a>			Schell, Wagner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

oral exam, 20- 30 min

**Prerequisites**

none

Below you will find excerpts from events related to this course:

V

**Advanced powder metals**2126749, SS 2024, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**  
**Blended (On-Site/Online)****Literature**

- W. Schatt ; K.-P. Wieters ; B. Kieback. ".Pulvermetallurgie: Technologien und Werkstoffe", Springer, 2007
- R.M. German. "Powder metallurgy and particulate materials processing. Metal Powder Industries Federation, 2005
- F. Thümmel, R. Oberacker. "Introduction to Powder Metallurgy", Institute of Materials, 1993

T

## 8.106 Course: HR-Management 1: HR Strategies in the Age of AI [T-WIWI-113745]

**Responsible:** Prof. Dr. Petra Nieken

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-105928 - HR Management & Digital Workplace](#)  
[M-WIWI-106860 - Leadership & Sustainable HR-Management](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2573005	<a href="#">HR-Management 1: HR strategies in the age of AI</a>	2 SWS	Lecture / 🗣️	Nieken
WT 24/25	2573006	<a href="#">Übung zu HR-Management 1: HR Strategies in the age of AI</a>	1 SWS	Practice / 🗣️	Nieken, Mitarbeiter
Exams					
WT 24/25	7900200	<a href="#">HR-Management 1: HR strategies in the age of AI (formerly Human Resource Management)</a>			Nieken

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✖ Canceled

### Competence Certificate

The assessment is conducted in the form of an oral (30 minutes) or written (60 minutes) examination (according to §4(2), 1 examination regulations). The exam is offered every semester and can be retaken at any regular examination date.

### Prerequisites

None

### Recommendation

Prior attendance of the Business Administration module is recommended.

Below you will find excerpts from events related to this course:

V

### HR-Management 1: HR strategies in the age of AI

2573005, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site



**Content**

In this course, students will acquire fundamental knowledge in the field of human resource management and delve deeply into the future of work. We explore not only classical topics but also the significance of artificial intelligence in the workplace, along with selected aspects related to sustainability and shaping the future of work. Drawing from microeconomic and behavioral economic approaches, we analyze various processes and tools in human resource management. We evaluate their alignment with corporate strategy. We investigate how we can design workplaces sustainably while considering the individual needs of employees. In addition, we look at how AI is transforming our work environment and the opportunities and challenges it presents. Going beyond theoretical concepts, we validate our insights using real-world data from research papers and current events. Discussions are strongly encouraged!

**Learning Outcomes**

The student

- understands the processes and instruments of human resource management.
- analyzes different methods and evaluates their usefulness with a special focus on AI.
- analyzes different processes and evaluates the strengths and weaknesses.
- understands the challenges of human resource management and its link to corporate strategy with a special focus on AI and sustainability aspects.
- possesses knowledge about the applicability and challenges of different scientific research methods and open science.

**Workload**

The total workload for this course is approximately 135 hours.

Lecture: 32 hours

Preparation of lecture: 52 hours

Exam preparation: 51 hours

**Literature**

- Personalmanagement, Stock-Homburg, 2019
- Personnel Economics, Kuhn, 2017
- Research papers and case studies (will be provided during the lecture)

T

**8.107 Course: Hydraulic Engineering and Water Management [T-BGU-101667]**

**Responsible:** Prof. Dr. Mario Jorge Rodrigues Pereira da Franca  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

**Type**  
Written examination

**Credits**  
4

**Grading scale**  
Grade to a third

**Recurrence**  
Each winter term

**Version**  
1

Events					
WT 24/25	6200511	<a href="#">Wasserbau und Wasserwirtschaft</a>	2 SWS	Lecture	Rodrigues Pereira da Franca
WT 24/25	6200512	<a href="#">Übungen zu Wasserbau und Wasserwirtschaft</a>	1 SWS	Practice	Seidel

**Competence Certificate**

written exam with 60 minutes

**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

T


## 8.108 Course: Hydrogen and reFuels - Energy Conversion in Combustion Engines [T-MACH-111585]





**Responsible:** Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101275 - Combustion Engines I](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	4	Grade to a third	Each winter term	1 terms	1

Events					
WT 24/25	2134155	<a href="#">Hydrogen and reFuels - Energy Conversion in Combustion Engines</a>	2 SWS	Lecture / 	Koch
Exams					
ST 2024	76-T-MACH-105564	<a href="#">Hydrogen and reFuels - Energy Conversion in Combustion Engines</a>	Koch, Kubach		

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

oral exam, appr. 25 minutes, no auxillary means

### Prerequisites

none

Below you will find excerpts from events related to this course:

V

### Hydrogen and reFuels - Energy Conversion in Combustion Engines

2134155, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

New types of CO<sub>2</sub>-neutral fuels such as gaseous hydrogen but also liquid synthetic fuels often place specific requirements on engine systems that differ significantly from operation with conventional fuels. These special aspects of engine energy conversion are dealt with in this lecture.

Introduction

Thermodynamics of combustion engines

Fundamentals

gas exchange

Flow field

Wall heat losses

Combustion in gasoline engines

Pressure Trace Analysis

Combustion in Diesel engines



Specific Topics of Hydrogen Combustion





Waste heat recovery

T

## 8.109 Course: Hydrology [T-BGU-101693]

**Responsible:** Prof. Dr.-Ing. Erwin Zehe**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)**Type**  
Written examination**Credits**  
4**Grading scale**  
Grade to a third**Recurrence**  
Each winter term**Version**  
2

Events					
WT 24/25	6200513	<a href="#">Hydrology</a>	2 SWS	Lecture / 	Zehe, Wienhöfer
WT 24/25	6200514	<a href="#">Tutorial Hydrology</a>	1 SWS	Practice / 	Zehe, Wienhöfer
Exams					
ST 2024	8230101693	<a href="#">Hydrology</a>			Wienhöfer, Zehe

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

T



**8.110 Course: I4.0 Systems Platform [T-MACH-106457]**




**Responsible:** Dipl.-Ing. Thomas Maier  
Prof. Dr.-Ing. Jivka Ovtcharova

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each term	2

Events					
ST 2024	2123900	<a href="#">I4.0 Systems platform</a>	4 SWS	Project (P / 	Meyer, Maier
WT 24/25	2123900	<a href="#">I4.0 Systems platform</a>	4 SWS	Project (P / 	Meyer, Rönnau, Maier
Exams					
ST 2024	76-T-MACH-106457	<a href="#">I4.0 Systems platform</a>	Meyer		

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Alternative exam assessment (project work)

**Prerequisites**

None

**Annotation**

Limited number of participants.

Below you will find excerpts from events related to this course:

V

**I4.0 Systems platform**

2123900, SS 2024, 4 SWS, Language: German, [Open in study portal](#)

**Project (PRO)**  
**On-Site**

**Content**

Industry 4.0, IT systems for fabrication (e.g.: CAx, PDM, CAM, ERP, MES), process modelling and execution, project work in teams, practice-relevant I4.0 problems, in automation, manufacturing industry and service.

Students can

- describe the fundamental concepts, challenges, and objectives of Industrie 4.0 and name the essential terms in context of information management
- explain the necessary information flow between the different IT systems. They get practically knowledge about using current IT systems in context of I4.0, from order to production.
- map and analyze processes in the context of Industry 4.0 with special methods of process modelling
- collaboratively grasp practical I4.0 issues using existing hardware and software and work out solutions for a continuous improvement process in a team
- prototypically implement the self-developed solution proposal with the given IT systems and the existing hardware equipment and finally present the results

**Literature**

Keine / None

V

**I4.0 Systems platform**

2123900, WS 24/25, 4 SWS, Language: German, [Open in study portal](#)

**Project (PRO)**  
**On-Site**

**Content**

Industry 4.0, IT systems for fabrication (e.g.: CAx, PDM, CAM, ERP, MES), process modelling and execution, project work in teams, practice-relevant I4.0 problems, in automation, manufacturing industry and service.

Students can

- describe the fundamental concepts, challenges, and objectives of Industrie 4.0 and name the essential terms in context of information management
- explain the necessary information flow between the different IT systems. They get practically knowledge about using current IT systems in context of I4.0, from order to production.
- map and analyze processes in the context of Industry 4.0 with special methods of process modelling
- collaboratively grasp practical I4.0 issues using existing hardware and software and work out solutions for a continuous improvement process in a team
- prototypically implement the self-developed solution proposal with the given IT systems and the existing hardware equipment and finally present the results

**Organizational issues**

Auftakt: Mi 23 Okt 10:00h - G20.20 (EG) R061

**Literature**

Keine / None

T

**8.111 Course: Ignition Systems [T-MACH-105985]****Responsible:** Dr.-Ing. Olaf Toedter**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Grading scale	Version
Oral examination	4	Grade to a third	1

Events					
WT 24/25	2133125	<a href="#">Ignition systems</a>	2 SWS	Lecture /	Toedter
Exams					
ST 2024	76-T-MACH-105985	<a href="#">Ignition systems</a>			Toedter

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

oral exam, 20 min

**Prerequisites**

none

Below you will find excerpts from events related to this course:

V

**Ignition systems**2133125, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)  
On-Site****Content**

- Ignition Process
- Spark Ignition
- Principle of Spark Ignition Systems
- Limits of Spark Ignition
- New Developments of Spark Ignition Systems
- New an Alternative Ignition Systems

## T

## 8.112 Course: Industrial Organization [T-WIWI-102844]

**Responsible:** Prof. Dr. Johannes Philipp Reiß  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-101501 - Economic Theory](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Irregular	1

Events					
ST 2024	2560238	<a href="#">Industrial Organization</a>	2 SWS	Lecture / 🗣️	Reiß
ST 2024	2560239	<a href="#">Übung zu Industrieökonomie</a>	1 SWS	Practice / 🗣️	Reiß, Potarca
Exams					
ST 2024	7910002	<a href="#">Industrial Organization</a>			Reiß

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✖ Canceled

**Competence Certificate**

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

**Recommendation**

Completion of the module Economics [WW1VWL] is assumed.

**Annotation**

This course is not given in summer 2017.

Below you will find excerpts from events related to this course:

## V

**Industrial Organization**

2560238, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Literature****Verpflichtende Literatur:**

H. Bester (2012): Theorie der Industrieökonomik, Springer-Verlag.

**Ergänzende Literatur:**

J. Tirole (1988): Theory of Industrial Organization, MIT Press.

D. Carlton / J. Perloff (2005): Modern Industrial Organization, Pearson.

P. Belleflamme / M. Peitz (2010): Industrial Organization



T



**8.113 Course: Information Engineering [T-MACH-102209]**





**Responsible:** Prof. Dr.-Ing. Anne Meyer  
Prof. Dr.-Ing. Jivka Ovtcharova

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	2

Events					
ST 2024	2122014	<a href="#">Information Engineering</a>	2 SWS	Seminar / 	Meyer, Mitarbeiter
WT 24/25	2121355	<a href="#">Information Engineering</a>	2 SWS	Seminar / 	Meyer, Rönnau
Exams					
ST 2024	76-T-MACH-102209	<a href="#">Information Engineering</a>			Meyer, Rönnau, Ovtcharova

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled


**Competence Certificate**

Alternative exam assessment (written composition and speech)

**Prerequisites**

None

Below you will find excerpts from events related to this course:

	<b>Information Engineering</b> 2122014, SS 2024, 2 SWS, Language: German/English, <a href="#">Open in study portal</a>	<b>Seminar (S)</b> <b>Blended (On-Site/Online)</b>
-------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------

**Content**


Seminar papers on current research topics of the Institute for Information Management in Engineering. The respective topics are presented at the beginning of each semester.

**Organizational issues**

Siehe ILIAS-Kurs

**Literature**

Themenspezifische Literatur

	<b>Information Engineering</b> 2121355, WS 24/25, 2 SWS, Language: German/English, <a href="#">Open in study portal</a>	<b>Seminar (S)</b> <b>Blended (On-Site/Online)</b>
-------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------

**Content**

Seminar papers on current research topics of the Institute for Information Management in Engineering. The respective topics are presented at the beginning of each semester.

**Organizational issues**



Ort und Zeit siehe ILIAS





**Literature**

Themenspezifische Literatur

T

**8.114 Course: Integrated Information Systems for Engineers [T-MACH-102083]****Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)**Type**  
Oral examination**Credits**  
4**Grading scale**  
Grade to a third**Recurrence**  
Each summer term**Version**  
2

Events					
ST 2024	2121001	<a href="#">Integrated Information Systems for engineers</a>	3 SWS	Lecture / Practice (/ 	Elstermann, Meyer
WT 24/25	2121001	<a href="#">Integrated Information Systems for engineers</a>	3 SWS	Lecture / Practice (/ 	Elstermann
Exams					
ST 2024	76-T-MACH-102083	<a href="#">Integrated Information Systems for Engineers</a>			Ovtcharova, Elstermann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Oral examination 20 min.

**Prerequisites**

None

Below you will find excerpts from events related to this course:

V

**Integrated Information Systems for engineers**2121001, SS 2024, 3 SWS, Language: German, [Open in study portal](#)Lecture / Practice (VÜ)  
On-Site**Content**

- Information systems, information management
- CAD, CAP and CAM systems
- PPS, ERP and PDM systems
- Knowledge management and ontology
- Process modeling

Students can:

- illustrate the structure and operating mode of information systems
- describe the structure of relational databases
- describe the fundamentals of knowledge management and its application in engineering and deploy ontology as knowledge representation
- describe different types of process modelling and their application and illustrate and execute simple work flows and processes with selected tools
- explain different goals of specific IT systems in product development (CAD, CAP, CAM, PPS, ERP, PDM) and assign product development processes

**Literature**

Vorlesungsfolien / lecture slides

V

**Integrated Information Systems for engineers**2121001, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)Lecture / Practice (VÜ)  
On-Site

**Content**

- Information systems, information management
- CAD, CAP and CAM systems
- PPS, ERP and PDM systems
- Knowledge management and ontology
- Process modeling

**Students can:**

- illustrate the structure and operating mode of information systems
- describe the structure of relational databases
- describe the fundamentals of knowledge management and its application in engineering and deploy ontology as knowledge representation
- describe different types of process modelling and their application and illustrate and execute simple work flows and processes with selected tools
- explain different goals of specific IT systems in product development (CAD, CAP, CAM, PPS, ERP, PDM) and assign product development processes

**Organizational issues**

Blockveranstaltung vom 07. - 10. Oktober

**Literature**

Vorlesungsfolien / lecture slides

T

## 8.115 Course: Integrated Production Planning in the Age of Industry 4.0 [T-MACH-109054]

**Responsible:** Prof. Dr.-Ing. Gisela Lanza

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101272 - Integrated Production Planning](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	Each summer term	1

Events					
ST 2024	2150660	<a href="#">Integrated Production Planning in the Age of Industry 4.0</a>	6 SWS	Lecture / Practice (/)	Lanza
Exams					
ST 2024	76-T-MACH-109054	<a href="#">Integrated Production Planning in the Age of Industry 4.0</a>			Lanza
WT 24/25	76-T-MACH-109054	<a href="#">Integrated Production Planning in the Age of Industry 4.0</a>			Lanza

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

Written Exam (120 min)

### Prerequisites

"T-MACH-108849 - Integrierte Produktionsplanung im Zeitalter von Industrie 4.0" as well as "T-MACH-102106 Integrierte Produktionsplanung" must not be commenced.

Below you will find excerpts from events related to this course:

V

### Integrated Production Planning in the Age of Industry 4.0

2150660, SS 2024, 6 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)  
On-Site

**Content**

Integrated Production Planning in the age of Industry 4.0 will be taught in the context of this engineering science lecture. In addition to a comprehensive introduction to Industry 4.0, the following topics will be addressed at the beginning of the lecture:

- Basics, history and temporal development of production
- Integrated production planning and integrated digital engineering
- Principles of integrated production systems and further development with Industry 4.0

Building on this, the phases of integrated production planning are taught in accordance with VDI Guideline 5200, whereby special features of parts production and assembly are dealt with in the context of case studies:

- Factory planning system
- Definition of objectives
- Data collection and analysis
- Concept planning (structural development, structural dimensioning and rough layout)
- Detailed planning (PPS, process simulation as a validation tool, planning of conveyor technology and storage systems for linking production and IT systems in the I4.0 factory)
- Preparation and monitoring of implementation
- Start-up and series support

The lecture contents are complemented by numerous current practical examples with a strong Industry 4.0 reference. Aspects of sustainability are anchored in all units and thus basic knowledge of sustainable production planning is taught. Within the exercises the lecture contents are deepened and applied to specific problems and tasks.

**Learning Outcomes:**

The students ...

- can discuss basic questions of production technology.
- are able to apply the methods of integrated production planning to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques for a specific problem.
- can apply the learned methods of integrated production planning to new problems.
- can use their knowledge targeted for efficient production technology.
- know the basic features of sustainable production planning and can apply underlying knowledge.

**Workload:****MACH:**

regular attendance: 63 hours

self-study: 177 hours

**WING:**

regular attendance: 63 hours

self-study: 207 hours

**Organizational issues**

Vorlesungstermine dienstags 14.00 Uhr und donnerstags 14.00 Uhr, Übungstermine donnerstags 15.45 Uhr. Bekanntgabe der konkreten Übungstermine erfolgt in der ersten Vorlesung

**Literature****Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

T

## 8.116 Course: Integrative Strategies in Production and Development of High Performance Cars [T-MACH-105188]




**Responsible:** Karl-Hubert Schlichtenmayer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each summer term	1

Events					
ST 2024	2150601	<a href="#">Integrative Strategies in Production and Development of High Performance Cars</a>	2 SWS	Lecture / 	Schlichtenmayer
Exams					
ST 2024	76-T-MACH-105188	<a href="#">Integrative Strategies in Production and Development of High Performance Cars</a>			Schlichtenmayer
WT 24/25	76-T-MACH-105188	<a href="#">Integrative Strategies in Production and Development of High Performance Cars</a>			Schlichtenmayer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Written Exam (60 min)

### Prerequisites

none

Below you will find excerpts from events related to this course:

V

### Integrative Strategies in Production and Development of High Performance Cars

2150601, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The lecture deals with the technical and organizational aspects of integrated development and production of sports cars on the example of Porsche AG. The lecture begins with an introduction and discussion of social trends. The deepening of standardized development processes in the automotive practice and current development strategies follow. The management of complex development projects is a first focus of the lecture. The complex interlinkage between development, production and purchasing are a second focus. Methods of analysis of technological core competencies complement the lecture. The course is strongly oriented towards the practice and is provided with many current examples.

The main topics are:

- Introduction to social trends towards high performance cars
- Automotive Production Processes
- Integrative R&D strategies and holistic capacity management
- Management of complex projects
- Interlinkage between R&D, production and purchasing
- The modern role of manufacturing from a R&D perspective
- Global R&D and production
- Methods to identify core competencies

**Learning Outcomes:**

The students ...

- are capable to specify the current technological and social challenges in automotive industry.
- are qualified to identify interlinkages between development processes and production systems.
- are able to explain challenges and solutions of global markets and global production of premium products.
- are able to explain modern methods to identify key competences of producing companies.

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Literature****Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**


Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).





T

**8.117 Course: International Finance [T-WIWI-102646]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101402 - eFinance](#)  
[M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	see Annotations	1

Events					
ST 2024	2530570	<a href="#">International Finance</a>	2 SWS	Lecture / 	Walter, Uhrig-Homburg
Exams					
ST 2024	7900097	<a href="#">International Finance</a>			Uhrig-Homburg
WT 24/25	7900052	<a href="#">International Finance</a>			Uhrig-Homburg

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The success control takes place in form of a written examination (60 min). If the number of participants is low, an oral examination may also be offered. The examination is offered every semester and can be repeated at any regular examination date.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

The course is offered as a 14-day or block course.

Below you will find excerpts from events related to this course:

V

**International Finance**

2530570, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Organizational issues**

Kickoff am Mittwoch, 24.04.24, 15:45 - 19:00 Uhr im Raum 320 im Geb. 09.21 (Blücherstr. 17). Die Veranstaltung wird samstags als Blockveranstaltung angeboten, nach dem Kickoff nach Absprache.

**Literature****Weiterführende Literatur:**

- Eiteman, D. et al., Multinational Business Finance, 13. Auflage, 2012.
- Solnik, B. und D. McLeavey, Global Investments, 6. Auflage, 2008.



T

**8.118 Course: Internship [T-WIWI-102611]**

**Responsible:** Studiendekan des KIT-Studienganges  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101419 - Internship](#)

Type	Credits	Grading scale	Version
Completed coursework	10	pass/fail	2

**Competence Certificate**  
see module description

**Prerequisites**  
Kein

**T 8.119 Course: Introduction to Bionics [T-MACH-111807]**

**Responsible:** apl. Prof. Dr. Hendrik Hölscher  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each summer term	3

Events					
ST 2024	2142151	<a href="#">Introduction to Biomimetics</a>	2 SWS	Lecture /	Hölscher, Greiner
Exams					
ST 2024	76-T-MACH-102172	<a href="#">Introduction into Biomimetics</a>			Hölscher
WT 24/25	76-T-MACH-102172	<a href="#">Introduction into Biomimetics</a>			Hölscher

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**  
 written exam (duration: 60 minutes)

**Prerequisites**  
 none

**Annotation**  
 Brick T-MACH-102172 may not be started

Below you will find excerpts from events related to this course:

V

**Introduction to Biomimetics**

2142151, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**  
**On-Site**

**Content**  
 Bionics focuses on the design of technical products following the example of nature. For this purpose we have to learn from nature and to understand its basic design rules. Therefore, the lecture focuses on the analysis of the fascinating effects used by many plants and animals. Possible implementations into technical products are discussed in the end.

The students should be able analyze, judge, plan and develop biomimetic strategies and products.

Basic knowledge in physics and chemistry

The successful attendance of the lecture is controlled by a written examination.

**Organizational issues**  
 Im ILIAS werden Materialien (Videos, Originalliteratur, Übungen) zur Vertiefung zur Verfügung gestellt.


Für die schriftliche Klausur werden zwei Termine angeboten (erste Woche nach Vorlesungsende im Sommersemester und eine Woche vor Vorlesungsbeginn im Wintersemester).





**Literature**  
 Folien und Literatur werden in ILIAS zur Verfügung gestellt.

T

**8.120 Course: Introduction to Ceramics [T-MACH-100287]****Responsible:** apl. Prof. Dr. Günter Schell**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	6	Grade to a third	Each winter term	1

Events					
WT 24/25	2125757	<a href="#">Introduction to Ceramics</a>	3 SWS	Lecture / 	
Exams					
ST 2024	76-T-MACH-100287	<a href="#">Introduction to Ceramics</a>			Schell, Bucharsky, Wagner
WT 24/25	76-T-MACH-100287	<a href="#">Introduction to Ceramics</a>			Schell, Bucharsky, Wagner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

The assessment consists of an oral exam (30 min) taking place at a specific date.

The re-examination is offered at a specific date.

**Prerequisites**

None

Below you will find excerpts from events related to this course:

V

**Introduction to Ceramics**2125757, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)Lecture (V)  
Blended (On-Site/Online)**Literature**

- H. Salmang, H. Scholze, "Keramik", Springer
- Kingery, Bowen, Uhlmann, "Introduction To Ceramics", Wiley
- Y.-M. Chiang, D. Birnie III and W.D. Kingery, "Physical Ceramics", Wiley
- S.J.L. Kang, "Sintering, Densification, Grain Growth & Microstructure", Elsevier

**8.121 Course: Introduction to Energy Economics [T-WIWI-102746]**

**Responsible:** Prof. Dr. Wolf Fichtner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101464 - Energy Economics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5,5	Grade to a third	Each summer term	6

Events					
ST 2024	2581010	<a href="#">Introduction to Energy Economics</a>	2 SWS	Lecture /	Fichtner
ST 2024	2581011	<a href="#">Übungen zu Einführung in die Energiewirtschaft</a>	2 SWS	Practice /	Sandmeier, Fichtner, Scharnhorst
Exams					
ST 2024	7981010	<a href="#">Introduction to Energy Economics</a>			Fichtner

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (90 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

**Prerequisites**

None.

Below you will find excerpts from events related to this course:

**Introduction to Energy Economics**

2581010, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

1. Introduction: terms, units, conversions
2. The energy carrier gas (reserves, resources, technologies)
3. The energy carrier oil (reserves, resources, technologies)
4. The energy carrier hard coal (reserves, resources, technologies)
5. The energy carrier lignite (reserves, resources, technologies)
6. The energy carrier uranium (reserves, resources, technologies)
7. The final carrier source electricity
8. The final carrier source heat
9. Other final energy carriers (cooling energy, hydrogen, compressed air)

The student is able to

- characterize and judge the different energy carriers and their peculiarities,
- understand contexts related to energy economics.

**Literature****Weiterführende Literatur:**

Pfaffenberger, Wolfgang. Energiewirtschaft. ISBN 3-486-24315-2  
 Feess, Eberhard. Umweltökonomie und Umweltpolitik. ISBN 3-8006-2187-8  
 Müller, Leonhard. Handbuch der Elektrizitätswirtschaft. ISBN 3-540-67637-6  
 Stoft, Steven. Power System Economics. ISBN 0-471-15040-1  
 Erdmann, Georg. Energieökonomik. ISBN 3-7281-2135-5

T

**8.122 Course: Introduction to Engineering Geology [T-BGU-101500]****Responsible:** Prof. Dr. Philipp Blum**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)**Type**  
Written examination**Credits**  
5**Grading scale**  
Grade to a third**Recurrence**  
Each winter term**Version**  
1

Events					
WT 24/25	6339057	<a href="#">Einführung in die Ingenieurgeologie</a>	4 SWS	Lecture / Practice (	Blum, Fuchs
Exams					
ST 2024	8210_0100016	<a href="#">Introduction to Engineering Geology</a>			Blum

**Prerequisites**

none



T




## 8.123 Course: Introduction to Engineering Mechanics I: Statics and Strength of Materials [T-MACH-102208]

**Responsible:** Prof. Dr.-Ing. Alexander Fidlin  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101259 - Engineering Mechanics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each summer term	2

Events					
ST 2024	2162238	<a href="#">Introduction to Engineering Mechanics I: Statics and Strength of Materials</a>	2 SWS	Lecture / 	Römer
ST 2024	2162239	<a href="#">Introduction to Engineering Mechanics I: Statics and Strength of Materials (Tutorial)</a>	1 SWS	Practice / 	Römer, Luo
Exams					
ST 2024	76-T-MACH-102208-1	<a href="#">Introduction to Engineering Mechanics I: Statics (75 Min)</a>			Fidlin
ST 2024	76-T-MACH-102208-2	<a href="#">Introduction to Engineering Mechanics I: Statics and Strength of Materials (120 Min)</a>			Fidlin

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

The assessment consists of a written examination (120 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place in every semester. Re-examinations are offered at every ordinary examination date.

For students of economics the assessment consists of a written examination (Statics - 75 min.)

Permitted utilities: non-programmable calculator

### Prerequisites

None

Below you will find excerpts from events related to this course:

V

### Introduction to Engineering Mechanics I: Statics and Strength of Materials

2162238, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

Statics: force · moment · general equilibrium conditions · center of mass · inner force in structure · plane frameworks · theory of adhesion


T





## 8.124 Course: Introduction to Engineering Mechanics II : Dynamics [T-MACH-102210]

**Responsible:** Prof. Dr.-Ing. Alexander Fidlin  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101261 - Emphasis in Fundamentals of Engineering](#)  
[M-WIWI-101839 - Additional Fundamentals of Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	1

Events					
WT 24/25	2161276	<a href="#">Introduction to Engineering Mechanics II : Dynamics</a>	2 SWS	Lecture / 	Fidlin
Exams					
ST 2024	76-T-MACH-102210	<a href="#">Introduction to Engineering Mechanics II : Dynamics</a>			Fidlin

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment consists of a written examination (75 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination is offered every semester. Re-examinations are offered at every ordinary examination date.

Permitted utilities: non-programmable calculator, literature.

**Prerequisites**

None

Below you will find excerpts from events related to this course:

V

**Introduction to Engineering Mechanics II : Dynamics**  
 2161276, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

T


## 8.125 Course: Introduction to Finance and Accounting [T-WIWI-112820]





**Responsible:** Dr. Torsten Luedecke  
 Prof. Dr. Martin Ruckes  
 Dr. Jan-Oliver Strych  
 Prof. Dr. Marliese Uhrig-Homburg  
 Prof. Dr. Marcus Wouters

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-105769 - Financing and Accounting](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	2

Events					
ST 2024	2500025	<a href="#">Tutorial Introduction to Finance and Accounting</a>	2 SWS	Tutorial (	Wouters, Ruckes, Assistenten, Kohl
ST 2024	2610026	<a href="#">Introduction to Finance and Accounting</a>	2 SWS	Lecture / 	Ruckes, Wouters, Thimme
Exams					
ST 2024	7900043	<a href="#">Financing and Accounting</a>			Ruckes, Wouters, Luedecke
WT 24/25	7900005	<a href="#">Financing and Accounting</a>			Ruckes, Wouters, Luedecke

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Written Exam (150 min). The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

Below you will find excerpts from events related to this course:

V

### Introduction to Finance and Accounting

2610026, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

The lecture covers the following topics:

- Investment and Finance
  - Valuation of Bonds and Stocks
  - Capital Budgeting
  - Portfolio Theory
- Financial Accounting
- Management Accounting

### Literature

Ausführliche Literaturhinweise werden in den Materialien zur Vorlesung gegeben.



## T

## 8.126 Course: Introduction to Game Theory [T-WIWI-102850]

**Responsible:** Prof. Dr. Clemens Puppe  
Prof. Dr. Johannes Philipp Reiß

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-101501 - Economic Theory](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	3

Events					
ST 2024	2520525	<a href="#">Introduction to Game Theory</a>	2 SWS	Lecture / 🗣️	Puppe, Rosar, Rau
ST 2024	2520526	<a href="#">Übungen zu Einführung in die Spieltheorie</a>	1 SWS	Practice / 🗣️	Puppe, Rosar, Rau
Exams					
ST 2024	7900271	<a href="#">Introduction to Game Theory</a>			Puppe
WT 24/25	7900006	<a href="#">Introduction to Game Theory</a>			Puppe

Legend: 🗣️ Online, 🗣️🗣️ Blended (On-Site/Online), 🗣️ On-Site, ✕ Cancelled

### Competence Certificate

The assessment consists of a written exam (60 minutes) according to Section 4(2),1 of the examination regulation.

The exam takes place in the recess period and can be repeated at every ordinary examination date.

### Recommendation

Knowledge from the lecture "Economics I: Microeconomics" is recommended. Furthermore, basic knowledge of mathematics and statistics is assumed.

Below you will find excerpts from events related to this course:

## V

### Introduction to Game Theory

2520525, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

The course focusses on non-cooperative game theory. It discusses models, solution concepts, and applications for simultaneous games as well as sequential games. Various solution concepts, e.g., Nash equilibrium and subgame-perfect equilibrium, are introduced along with more advanced concepts.

The assessment consists of a written exam (60 minutes) according to Section 4(2),1 of the examination regulation.

The exam takes place in the recess period and can be resited at every ordinary examination date.

Recommendation: You should have passed the module [M-WIWI-101398] *Introduction to Economics*.

### Recommendations:

Basic knowledge of mathematics and statistics is assumed.

This course offers an introduction to the theoretical analysis of strategic interaction situations. At the end of the course, students shall be able to analyze situations of strategic interaction systematically and to use game theory to predict outcomes and give advice in applied economics settings.

### Compulsory textbook:

Gibbons (1992): A Primer in Game Theory, Harvester-Wheatsheaf.

### Additional Literature:

Berninghaus/Ehrhart/Güth (2010): Strategische Spiele, Springer Verlag.

Binmore (1991): Fun and Games, DC Heath.

Fudenberg/Tirole (1991): Game Theory, MIT Press.

Heifetz (2012): Game Theory, Cambridge Univ. Press.

**Literature**

**Verpflichtende Literatur:**

Gibbons (1992): A Primer in Game Theory, Harvester-Wheatsheaf.

**Ergänzende Literatur:**

Berninghaus/Ehrhart/Güth (2010): Strategische Spiele, Springer Verlag.

Binmore (1991): Fun and Games, DC Heath.

Fudenberg/Tirole (1991): Game Theory, MIT Press.

Heifetz (2012): Game Theory, Cambridge Univ. Press.

T


## 8.127 Course: Introduction to GIS for Students of Natural, Engineering and Geo Sciences [T-BGU-101681]





**Responsible:** Dr.-Ing. Sven Wursthorn

**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences

**Part of:** M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each winter term	4

Events					
WT 24/25	6071101	Einführung in GIS für Studierende natur-, ingenieur- und geowissenschaftlicher Fachrichtungen, V/Ü	4 SWS	Lecture / Practice (/  )	Wursthorn
Exams					
ST 2024	8280101681	Introduction to GIS for Students of Natural, Engineering and Geo Sciences			Wursthorn
WT 24/25	8280101681	Introduction to GIS for Students of Natural, Engineering and Geo Sciences			Wursthorn

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

written exam, 90 min.

T


## 8.128 Course: Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite [T-BGU-103541]





**Responsible:** Dr.-Ing. Sven Wursthorn

**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences

**Part of:** M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	3	pass/fail	Each winter term	4

Events					
WT 24/25	6071101	Einführung in GIS für Studierende natur-, ingenieur- und geowissenschaftlicher Fachrichtungen, V/Ü	4 SWS	Lecture / Practice (/  )	Wursthorn
Exams					
ST 2024	8280103541	Introduction to GIS for Students of Natural, Engineering and Geo Sciences			Wursthorn
WT 24/25	8280103541	Introduction to GIS for Students of Natural, Engineering and Geo Sciences			Wursthorn

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

The achievement control takes place via accepted exercises.

### Prerequisites

none

### Recommendation

none

### Annotation

none

## T

## 8.129 Course: Introduction to Machine Learning [T-WIWI-111028]

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
Dr. Abdolreza Nazemi

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-105482 - Machine Learning and Data Science](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	4,5	Grade to a third	Each winter term	1 terms	1

Events					
WT 24/25	2540539	<a href="#">Introduction to Machine Learning</a>	2 SWS	Lecture / 🗣️	Nazemi
WT 24/25	2540540	<a href="#">Übung zu Introduction to Machine Learning</a>	1 SWS	Practice / 🗣️	Nazemi
Exams					
ST 2024	7900076	<a href="#">Introduction to Machine Learning</a>			Geyer-Schulz
WT 24/25	7900349	<a href="#">Introduction to Machine Learning (WS 2024/2025)</a>			Geyer-Schulz

Legend: 🗣️ Online, 🗣️🗣️ Blended (On-Site/Online), 🗣️ On-Site, ✖ Canceled

### Competence Certificate

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five-point-steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Below you will find excerpts from events related to this course:

## V

### Introduction to Machine Learning

2540539, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

- Introduction
- Data Cleaning
- Data Visualization
- Linear Regression
- Logistic Regression
- Tree-based Algorithms
- Support Vector Machine
- Shrinkage Models
- Dimensionality Reduction
- Clustering

### Literature

- Alpaydin, E. (2014). *Introduction to Machine Learning*. Third Edition, MIT Press.
- Hall, J. (2020). *Machine Learning in Business: An Introduction to the World of Data Science*. Independently published.
- James, G., Witten, D., Hastie, T., and R. Tibshirani (2013). *An Introduction to Statistical Learning: with Applications in R*. Springer.
- Tan, P. N., Steinbach, M., Karpatne, A., & Kumar, V. (2018). *Introduction to data mining*. Pearson

**8.130 Course: Introduction to Microsystem Technology - Practical Course [T-MACH-108312]****Responsible:** Dr. Arndt Last**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	4	pass/fail	Each term	1

Events					
ST 2024	2143877	<a href="#">Introduction to Microsystem Technology - Practical Course</a>	2 SWS	Practical course /	Last
WT 24/25	2143877	<a href="#">Introduction to Microsystem Technology - Practical Course</a>	2 SWS	Practical course /	Last
Exams					
ST 2024	76-T-MACH-108312	<a href="#">Introduction to Microsystem Technology - Practical Course</a>			Last
WT 24/25	76-T-MACH-108312	<a href="#">Introduction to Microsystem Technology - Practical Course</a>			Last

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

non-graded written examination

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**Introduction to Microsystem Technology - Practical Course**2143877, SS 2024, 2 SWS, Language: German, [Open in study portal](#)**Practical course (P)  
On-Site****Content**

In the practical training includes nine experiments:

1. X-ray optics
2. UVL + REM
3. Micromixer
4. Atomic force microscopy
5. 3D-Printing
6. Light diffraction at Chromium masks
7. Moulding
8. SAW-bio-sensors
9. Nano3D-printer - material transfer of thin foils
10. Electro spinning

Each student takes part in only four experiments.

The experiments are carried out at real workstations at the IMT and coached by IMT-staff.

**Organizational issues**

Das Praktikum findet in den Laboren des IMT am KIT-CN statt. Treffpunkt: Eingang Bau 301.

Teilnahmeanfragen an Dr. A. Last, [arndt.last@kit.edu](mailto:arndt.last@kit.edu)**Literature**

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997

Unterlagen zum Praktikum zur Vorlesung 'Grundlagen der Mikrosystemtechnik'

**Introduction to Microsystem Technology - Practical Course**2143877, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)**Practical course (P)  
On-Site****Literature**

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997  
Unterlagen zum Praktikum zur Vorlesung 'Grundlagen der Mikrosystemtechnik'

T


**8.131 Course: Introduction to Microsystem Technology I [T-MACH-105182]**





**Responsible:** Dr. Vlad Badilita  
Dr. Mazin Jouda  
Prof. Dr. Jan Gerrit Korvink

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each winter term	1

Events					
WT 24/25	2141861	<a href="#">Introduction to Microsystem Technology I</a>	2 SWS	Lecture / 	Korvink, Badilita
Exams					
ST 2024	76-T-MACH-105182	<a href="#">Introduction to Microsystem Technology I</a>			Korvink, Badilita
WT 24/25	76-T-MACH-105182	<a href="#">Introduction to Microsystem Technology I</a>			Korvink, Badilita

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

written examination (60 min)

**Prerequisites**

none

Below you will find excerpts from events related to this course:

V

**Introduction to Microsystem Technology I**

2141861, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

**Literature**

Mikrosystemtechnik für Ingenieure, W. Menz und J. Mohr, VCH Verlagsgesellschaft, Weinheim 2005

M. Madou

Fundamentals of Microfabrication

Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011



**8.132 Course: Introduction to Microsystem Technology II [T-MACH-105183]**

**Responsible:** Dr. Mazin Jouda  
Prof. Dr. Jan Gerrit Korvink

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each summer term	1

Events					
ST 2024	2142874	<a href="#">Introduction to Microsystem Technology II</a>	2 SWS	Lecture /	Korvink, Badilita
Exams					
ST 2024	76-T-MACH-105183	<a href="#">Introduction to Microsystem Technology II</a>			Korvink, Badilita
WT 24/25	76-T-MACH-105183	<a href="#">Introduction to Microsystem Technology II</a>			Korvink, Badilita

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**  
written examination (60 min)

**Prerequisites**  
none

Below you will find excerpts from events related to this course:

**Introduction to Microsystem Technology II**

2142874, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

- Introduction in Nano- and Microtechnologies
- Lithography
- LIGA-technique
- Mechanical microfabrication
- Patterning with lasers
- Assembly and packaging
- Microsystems

**Organizational issues**

Topic: Grundlagen der Mikrosystemtechnik II (MST II) SS 21

Time: Thursdays 14:00 - 15:30

[10.91 Redtenbacher-Hörsaal](#)

**Literature**

Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

M. Madou

Fundamentals of Microfabrication

Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011

T

## 8.133 Course: Introduction to Neural Networks and Genetic Algorithms [T-WIWI-111029]

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105482 - Machine Learning and Data Science](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	4,5	Grade to a third	Each summer term	1 terms	1

Events					
ST 2024	2540541	<a href="#">Introduction to Neural Networks and Genetic Algorithms</a>	2 SWS	Lecture	Geyer-Schulz
ST 2024	2540542	<a href="#">Übung Introduction to Neural Networks and Genetic Algorithms</a>	1 SWS	Practice	Geyer-Schulz
Exams					
ST 2024	7900303	<a href="#">Introduction to Neural Networks and Genetic Algorithms</a>			Geyer-Schulz
WT 24/25	7900295	<a href="#">Introduction to Neural Networks and Genetic Algorithms (Nachklausur SoSe 2024)</a>			Geyer-Schulz

### Competence Certificate

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five-point-steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Below you will find excerpts from events related to this course:

V

### Introduction to Neural Networks and Genetic Algorithms

2540541, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

The course consists of a short introduction and two parts:

1. In the introduction, the biological mechanisms of neural and genetic methods are presented. Furthermore, a common framework for the learning performance evaluation of these methods in applications is introduced.
2. In the field of genetic methods, simple genetic algorithms and their variants are introduced, analyzed, and applied.
3. In the area of neural methods, the basic algorithms are presented (e.g., backpropagation) as well as their applications in data science.

### Learning Objectives:

The student knows the essential algorithms, learning procedures, and methods for neural networks and genetic algorithms. They can apply these methods (e.g. in R) and evaluate their quality.

### Literature

- Goldberg, David E. (2001)  
Genetic Algorithms in Search, Optimization and Machine Learning.  
Addison-Wesley, New York.
- Bishop, Christopher M. (2006)  
Pattern Recognition and Machine Learning.  
Springer, New York.
- Goodfellow, Ian; Bengio, Yoshua; Courville, Aaron (2016)  
Deep Learning.  
MIT Press. Cambridge.

**8.134 Course: Introduction to Operations Research I and II [T-WIWI-102758]**

**Responsible:** Prof. Dr. Stefan Nickel  
Prof. Dr. Steffen Rebennack  
Prof. Dr. Oliver Stein

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-101418 - Introduction to Operations Research](#)








**Type**  
Written examination





**Credits**  
9

**Grading scale**  
Grade to a third

**Recurrence**  
see Annotations

**Version**  
2

Events					
ST 2024	2500008	<a href="#">Computer Exercises on Introduction to Operations Research I</a>	1 SWS	Tutorial (/  )	Dunke
ST 2024	2550040	<a href="#">Introduction to Operations Research I</a>	2 SWS	Lecture / 	Nickel
ST 2024	2550043	<a href="#">Tutorials on Introduction to Operations Research I</a>	2 SWS	Tutorial (/ 	Dunke
WT 24/25	2500030	<a href="#">Computer Exercises on Introduction to Operations Research II</a>	1 SWS	Tutorial (/ 	Dunke
WT 24/25	2530043	<a href="#">Introduction to Operations Research II</a>		Lecture / 	Nickel
WT 24/25	2530044			Tutorial (/ 	Dunke
WT 24/25	2550043	<a href="#">Introduction to Operations Research II</a>		Lecture / 	Nickel
Exams					
ST 2024	7900079	<a href="#">Introduction to Operations Research I and II</a>			Rebennack

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment of the module is carried out by a written examination (120 minutes) according to Section 4(2), 1 of the examination regulation.

In each term (usually in March and August), one examination is held for both courses.

The overall grade of the module is the grade of the written examination.

**Prerequisites**

None

**Recommendation**

Knowledge of Mathematics I and II is recommended, as well as programming knowledge for the software laboratory.

It is strongly recommended to attend the course Introduction to Operations Research I

[2550040] before attending the course Introduction to Operations Research II

[2530043].

Below you will find excerpts from events related to this course:

**Introduction to Operations Research I**

2550040, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

Examples for typical OR problems.

Linear Programming: Basic notions, simplex method, duality, special versions of the simplex method (dual simplex method, three phase method), sensitivity analysis, parametric optimization, game theory.

Graphs and Networks: Basic notions of graph theory, shortest paths in networks, project scheduling, maximal and minimal cost flows in networks.

**Learning objectives:**

The student

- names and describes basic notions of linear programming as well as graphs and networks,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve optimization problems independently,
- validates, illustrates and interprets the obtained solutions.

**Literature**

- Nickel, Rebennack, Stein, Waldmann: Operations Research, 3. Auflage, Springer, 2022
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

**Introduction to Operations Research II**

2530043, WS 24/25, SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

Integer and combinatorial optimization: basic concepts, cutting plane methods, branch-and-bound methods, branch-and-cut methods, heuristic methods.

Nonlinear optimization: basic concepts, optimality conditions, solution methods for convex and nonconvex optimization problems.

Dynamic and stochastic models and methods: Dynamic optimization, Bellman methods, lot-sizing models and dynamic and stochastic models of inventory, queues.

**Learning Objectives:**

The student

- knows and describes the basic concepts of integer and combinatorial optimization, nonlinear optimization and dynamic optimization,
- knows the methods and models indispensable for a quantitative analysis,
- models and classifies optimization problems and selects appropriate solution procedures to solve simple optimization problems independently,
- validates, illustrates and interprets obtained solutions.

**Literature**

- Nickel, Stein, Waldmann: Operations Research, 2. Auflage, Springer, 2014
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

**Introduction to Operations Research II**

2550043, WS 24/25, SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

Integer and Combinatorial Programming: Basic notions, cutting plane methods, branch and bound methods, branch and cut methods, heuristics.

Nonlinear Programming: Basic notions, optimality conditions, solution methods for convex and nonconvex optimization problems.

Dynamic and stochastic models and methods: dynamical programming, Bellman method, lot sizing models, dynamical and stochastic inventory models, queuing theory.

**Learning objectives:**

The student

- names and describes basic notions of integer and combinatorial optimization, nonlinear programming, and dynamic programming,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve optimization problems independently,
- validates, illustrates and interprets the obtained solutions.

**Literature**

- Nickel, Stein, Waldmann: Operations Research, 2. Auflage, Springer, 2014
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

**8.135 Course: Introduction to Programming with Java [T-WIWI-102735]**

**Responsible:** Prof. Dr.-Ing. Johann Marius Zöllner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101581 - Introduction to Programming](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	2

Events					
WT 24/25	2511000	<a href="#">Introduction to Programming with Java</a>	3 SWS	Lecture /	Zöllner
WT 24/25	2511002	<a href="#">Tutorien zu Programmieren I: Java</a>	1 SWS	Tutorial (	Zöllner, Stegmaier, Mütsch
WT 24/25	2511003	<a href="#">Computer lab Introduction to Programming with Java</a>	2 SWS		Zöllner, Stegmaier, Mütsch
Exams					
ST 2024	7900042	<a href="#">Introduction to Programming with Java</a>			Zöllner
WT 24/25	79AIFB_Prog1	<a href="#">Introduction to Programming with Java</a>			Zöllner

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written resp. computer-based exam (60 min) according to Section 4 (2),1 of the examination regulation.

The successful completion of the compulsory tests in the computer lab is prerequisites for admission to the written resp. computer-based exam.

The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

**Annotation**

see german version

Below you will find excerpts from events related to this course:

**Introduction to Programming with Java**

2511000, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The lecture "Introduction to Programming with Java " introduces systematic programming and provides essential practical basics for all advanced computer science lectures.

Based on considerations of the structured and systematic design of algorithms, the most important constructs of modern higher programming languages as well as programming methods are explained and illustrated with examples. One focus of the lecture is on teaching the concepts of object-oriented Programming. Java is used as the programming language. Knowledge of this language is required in advanced computer science lectures.

At the end of the lecture period, a written examination will be held for which admission must be granted during the semester after successful participation in the practices. The exact details will be announced in the lecture.

**Learning objectives:**

- Knowledge of the fundamentals, methods and systems of computer science.
- The students acquire the ability to independently solve algorithmic problems in the programming language Java, which dominates in business applications.
- In doing so, they will be able to find strategic and creative answers in finding solutions to well-defined, concrete and abstract problems.

**Workload:**

The total workload for this course is approximately 150 hours. For further information see German version.

**Literature**


Ratz, D. Schulmeister-Zimolong, D. Seese, J. Wiesenberger. Grundkurs Programmieren in Java. 8. Aktualisierte und erweiterte Auflage, Hanser 2018


T

## 8.136 Course: Introduction to Public Finance [T-WIWI-102877]

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101403 - Public Finance](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2560131	<a href="#">Introduction to Public Finance</a>	3 SWS	Lecture / 	Wigger
Exams					
ST 2024	790fiwi	<a href="#">Introduction to Public Finance</a>			Wigger
WT 24/25	790fiwi	<a href="#">Introduction to Public Finance</a>			Wigger

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Depending on the further pandemic development the assessment will consist either of an open book exam (following Art. 4, para. 2, clause 3 of the examination regulation), or of an 1h written exam (following Art. 4, para. 2, clause 1 of the examination regulation).

**Prerequisites**

None

Below you will find excerpts from events related to this course:

V

**Introduction to Public Finance**

2560131, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
Blended (On-Site/Online)

**Content**

The course *Introduction to Public Finance* provides an overview of the fundamental issues in public economics. The first part of the course deals with normative theories about the economic role of the state in a market economy. Welfare economics theory is offered as a base model, with which alternative normative theories are compared and contrasted. Within this theoretical framework, arguments concerning efficiency and equity are developed as justification for varying degrees of economic intervention by the state. The second part of the course deals with the positivist theory of public economics. Processes of public decision making are examined and the conditions that lead to market failures resulting from collective action problems are discussed. The third part of the course examines a variety of public spending programs, including social security systems, the public education system, and programs aimed at reducing poverty. The fifth part of the course addresses the key theoretical and political issues associated with fiscal federalism.

**Learning goals:**

Students are able to:

- critically assess the economic role of the state in a market economy
- explain and discuss key concepts in public finance, including: public goods; economic externalities; and market failure
- explain and critically discuss competing theoretical approaches to public finance, including welfare economics and public choice theory
- explain the theory of bureaucracy according to Weber and critically assess its strengths and weaknesses
- evaluate the incentives inherent in the bureaucratic model, as well as the more recent introduction of market-oriented incentives associated with public-sector reform

**Workload:**

The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

Literatur:

Wigger, B. U. 2006. *Grundzüge der Finanzwissenschaft*. Springer: Berlin.



T

## 8.137 Course: Introduction to Stochastic Optimization [T-WIWI-106546]

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** M-WIWI-101414 - Methodical Foundations of OR  
M-WIWI-103278 - Optimization under Uncertainty

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	3

Events					
ST 2024	2550470	<a href="#">Introduction to Stochastic Optimization</a>	2 SWS	Lecture / 📺	Rebennack
ST 2024	2550471	<a href="#">Übung zur Einführung in die Stochastische Optimierung</a>	1 SWS	Practice / 🎧	Rebennack, Kandora
ST 2024	2550474	<a href="#">Rechnerübung zur Einführung in die Stochastische Optimierung</a>	2 SWS	Others (sons)	Rebennack, Kandora
Exams					
ST 2024	7900311	<a href="#">Introduction to Stochastic Optimization</a>			Rebennack
WT 24/25	7900242	<a href="#">Introduction to Stochastic Optimization</a>			Rebennack

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🎧 On-Site, ✖ Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 minutes). The exam takes place in every semester.

**Prerequisites**

None.

**8.138 Course: Investments [T-WIWI-102604]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101435 - Essentials of Finance](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2024	2530575	<a href="#">Investments</a>	2 SWS	Lecture /	Uhrig-Homburg
ST 2024	2530576	<a href="#">Übung zu Investments</a>	1 SWS	Practice /	Uhrig-Homburg, Kargus
Exams					
ST 2024	7900109	<a href="#">Investments</a>			Uhrig-Homburg
WT 24/25	7900054	<a href="#">Investments</a>			Uhrig-Homburg

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Depending on further pandemic developments, the examination will be offered either as a 60-minute written examination or as an open-book examination (alternative exam assessment).

A bonus can be earned by correctly solving at least 50% of the posed bonus exercises. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

**Prerequisites**

None

**Recommendation**

Knowledge of Business Administration: Finance and Accounting [2610026] is recommended.

Below you will find excerpts from events related to this course:

**Investments**

2530575, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Literature****Weiterführende Literatur:**

Bodie/Kane/Marcus (2010): Essentials of Investments, 8. Aufl., McGraw-Hill Irwin, Boston

T


**8.139 Course: Laboratory Production Metrology [T-MACH-108878]**





**Responsible:** Prof. Dr.-Ing. Gisela Lanza  
Dr. Florian Stamer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	5	Grade to a third	Each summer term	2

Events					
ST 2024	2150550	<a href="#">Laboratory Production Metrology</a>	3 SWS	Practical course / 	Lanza, Stamer
Exams					
ST 2024	76-T-MACH-108878	<a href="#">Laboratory Production Metrology</a>			Lanza, Stamer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Alternative Test Achievement: Group presentation of 15 min at the beginning of each experiment and evaluation of the participation during the experiments

and

Oral Exam (15 min)

**Prerequisites**

none

**Annotation**

For organizational reasons the number of participants for the course is limited. Hence a selection process will take place. Applications are made via the homepage of wbk (<http://www.wbk.kit.edu/studium-und-lehre.php>).

Below you will find excerpts from events related to this course:

V

**Laboratory Production Metrology**

2150550, SS 2024, 3 SWS, Language: German, [Open in study portal](#)

**Practical course (P)  
On-Site**

**Content**

During this course, students get to know measurement systems that are used in a production system. In the age of Industry 4.0, sensors are becoming more important. Therefore, the application of in-line measurement technology such as machine vision and non-destructive testing is focussed. Additionally, laboratory based measurement technologies such as computed tomography are addressed. The students learn the theoretical background as well as practical applications for industrial examples. The students use sensors by themselves during the course. Additionally, they are trained on how to integrate sensors in production processes and how to analyze measurement data with suitable software.

The following topics are addressed:

- Classification and examples for different measurement technologies in a production environment
- Machine vision with optical sensors
- Information fusion based on optical measurements
- Robot-based optical measurements
- Non-destructive testing by means of acoustic measurements
- Coordinate measurement technology
- Industrial computed tomography
- Measurement uncertainty evaluation
- Analysis of production data by means of data mining

**Learning Outcomes:**

The students ...

- are able to name, describe and mark out different measurement technologies that are relevant in a production environment.
- are able to conduct measurements with the presented in-line and laboratory based measurement systems.
- are able to analyze measurement results and assess the measurement uncertainty of these.
- are able to deduce whether a work piece fulfills quality relevant specifications by analysing measurement results.
- are able to use the presented measurement technologies for a new task.

**Workload:**

regular attendance: 31,5 hours

self-study: 88,5 hours

**Organizational issues**

Aus organisatorischen Gründen ist die Teilnehmerzahl für die Lehrveranstaltung begrenzt. Infolgedessen wird ein Auswahlprozess stattfinden. Die Bewerbung erfolgt über die Homepage des wbk (<http://www.wbk.kit.edu/studium-und-lehre.php>).

For organizational reasons the number of participants for the course is limited. Hence a selection process will take place. Applications are made via the homepage of wbk (<http://www.wbk.kit.edu/studium-und-lehre.php>).

**Literature**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt. Ebenso wird auf gängige Fachliteratur verwiesen.

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>). Additional reference to literature will be provided, as well.

T

## 8.140 Course: Large Diesel and Gas Engines for Ship Propulsions [T-MACH-110816]

Responsible: Dr.-Ing. Heiko Kubach

Organisation:

Part of: [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Oral examination	4	Grade to a third	Each summer term	1 terms	1

Events					
ST 2024	2134154	<a href="#">Large Diesel and Gas Engines for Ship Propulsions</a>	2 SWS	Lecture /	Weisser
Exams					
ST 2024	76-T-MACH-110816	<a href="#">Großdiesel- und -gasmotoren für Schiffsantriebe</a>			Weisser

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

oral exam, 20 minutes

**Prerequisites**

None

Below you will find excerpts from events related to this course:

V

**Large Diesel and Gas Engines for Ship Propulsions**2134154, SS 2024, 2 SWS, Language: German, [Open in study portal](#)Lecture (V)  
On-Site**Content**

- Introduction and History
- Types of Ships and Propulsion Systems
- Thermodynamic
- Boosting
- Design
- Fuels
- Lubricants
- Injection of liquid Fuels
- Combustion Processes for liquid Fuels
- Injection of Gaseous Fuels
- Combustion Processes for Gaseous Fuels
- Emissions
- Integration of Engines in Ships
- Large Engines in other Applications

**Organizational issues**


ACHTUNG: abweichend von den hier aufgeführten regelmäßigen Mittwoch-Terminen muss die Vorlesung als Blockveranstaltung in KW 29 durchgeführt werden. Genaue Informationen entnehmen Sie bitte dem entsprechenden Iliaskurs.

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## 8.141 Course: Learning Factory "Global Production" [T-MACH-105783]

**Responsible:** Prof. Dr.-Ing. Gisela Lanza**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	6	Grade to a third	Each winter term	4

Events					
WT 24/25	2149612	<a href="#">Learning Factory "Global Production"</a>	4 SWS	/ 	Lanza
Exams					
WT 24/25	76-T-MACH-105783	<a href="#">Learning Factory "Global Production"</a>	Lanza		

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Alternative test achievement (graded):

- Knowledge acquisition in the context of the seminar (4 achievements 20 min each ) with weighting 40%.
- Interaction between participants with weighting 15%.
- Scientific colloquium (in groups of 3 students approx. 45 min each) with weighting 45%.

**Prerequisites**

none

**Annotation**

For organisational reasons, the number of participants for the course is limited to 20. As a result, a selection process will take place. Applications must be submitted via the wbk homepage (<http://www.wbk.kit.edu/lernfabrik.php>).

Due to the limited number of participants, advance registration is required.

Students should have previous knowledge in at least one of the following areas:

- Integrated Production Planning
- Global Production and Logistics
- Quality Management

Below you will find excerpts from events related to this course:

V

**Learning Factory "Global Production"**2149612, WS 24/25, 4 SWS, Language: German, [Open in study portal](#)

Blended (On-Site/Online)

**Content**

The learning factory "Global Production" serves as a modern teaching environment for the challenges of global production. To make this challenges come alive, students can run a production of electric motors under real production conditions.

The course is divided into e-learning units and presence dates. The e-learning units help to learn essential basics and to immerse themselves in specific topics (e.g. selection of location, supplier selection and planning of production networks). The focus of the presence appointments is the case-specific application of relevant methods for planning and control of production systems that are suitable for the location. In addition to traditional methods and tools to organize lean production systems (e.g. Kanban and JIT/ JIS, Line Balancing) the lecture in particular deals with site-specific quality assurance and scalable automation. Essential methods for quality assurance in complex production systems are taught and brought to practical experience by a Six Sigma project. In the area of scalable automation, it is important to find solutions for the adaption of the level of automation of the production system to the local production conditions (e.g. automated workpiece transport, integration of lightweight robots for process linking) and to implement them physically. At the same time safety concepts should be developed and implemented as enablers for human-robot collaboration.

The course also includes an excursion to the production plant for the manufacturing of electric motors of an industrial partner.

Main focus of the lecture:

- site selection
- site-specific factory planning
- site-specific quality assurance
- scalable automation
- supplier selection

**Learning Outcomes:**

The students are able to ...

- evaluate and select alternative locations using appropriate methods.
- use methods and tools of lean management to plan and manage production systems that are suitable for the location.
- use the Six Sigma method and apply goal-oriented process management.
- select an appropriate level of automation of the production units based on quantitative variables.
- make use of well-established methods for the evaluation and selection of suppliers.
- apply methods for planning a global production network depending on company-specific circumstances to sketch a suitable network and classify and evaluating it according to specific criteria.
- apply the learned methods and approaches with regard to problem solving in a global production environment and able to reflect their effectiveness.

**Workload:**

e-Learning: ~ 24 h

regular attendance: ~ 36 h

self-study: ~ 60 h

**Organizational issues**

Termine werden über die Institutshomepage bekanntgegeben.

Aus organisatorischen Gründen ist die Teilnehmerzahl für die Lehrveranstaltung auf 20 Teilnehmer begrenzt. Infolgedessen wird ein Auswahlprozess stattfinden. Die Bewerbung erfolgt über die Homepage des wbk (<http://www.wbk.kit.edu/studium-und-lehre.php>)

Aufgrund der begrenzten Teilnehmerzahl ist eine Voranmeldung erforderlich.

Die Studierenden sollten Vorkenntnisse in mindestens einem der folgenden Bereiche haben:

- Integrierte Produktionsplanung
- Globale Produktion und Logistik
- Qualitätsmanagement

For organisational reasons, the number of participants for the course is limited to 20. As a result, a selection process will take place. Applications must be submitted via the wbk homepage (<http://www.wbk.kit.edu/studium-und-lehre.php>).

Due to the limited number of participants, advance registration is required.

Students should have previous knowledge in at least one of the following areas:

- Integrated Production Planning
- Global Production and Logistics
- Quality Management

**Literature****Medien:**

E-Learning Plattform ilias, Powerpoint, Fotoprotokoll. Die Medien werden über ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

E-learning platform ilias, powerpoint, photo protocol. The media are provided through ilias (<https://ilias.studium.kit.edu/>).








T

## 8.142 Course: Logistics and Supply Chain Management [T-MACH-110771]

**Responsible:** Prof. Dr.-Ing. Kai Furmans**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-105298 - Logistics and Supply Chain Management](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	9	Grade to a third	Each summer term	4

Events					
ST 2024	2118078	<a href="#">Logistics and Supply Chain Management</a>	4 SWS	Lecture / 	Furmans, Alicke
Exams					
ST 2024	76-T-MACH-110771	<a href="#">Logistics and Supply Chain Management</a>			Furmans

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

The success control takes place in the form of an examination performance of a different kind. This is composed as follows:

- 50% assessment of a written examination (60 min) during the semester break
- 50% assessment of an oral examination (20 min) during the semester break

To pass the examination, both examination performances must be passed.

**Prerequisites**

The course T-WIWI-102870 "Logistics and Supply Chain Management" must not have been selected.

**Annotation**

The brick cannot be taken if one of the bricks "T-MACH-102089 - Logistics - Organisation, Design and Control of Logistic Systems" and "T-MACH-105181 - Supply Chain Management" has been taken.

Below you will find excerpts from events related to this course:

V

**Logistics and Supply Chain Management**2118078, SS 2024, 4 SWS, Language: English, [Open in study portal](#)Lecture (V)  
On-Site

**Content**

In the lecture "Logistics and Supply Chain Management", comprehensive and well-founded fundamentals of crucial issues in logistics and supply chain management are presented. Furthermore, the interaction of different design elements of supply chains is emphasized. For this purpose, both qualitative and quantitative models are presented and applied. Additionally, methods for mapping and evaluating logistics systems and supply chains are described. The contents of the lecture are deepened in exercises and case studies and comprehension is partially reviewed in case studies. The contents will be illustrated, among other things, on the basis of supply chains in the automotive industry.

Among others, the following topics are covered:

- Inventory Management
- Forecasting
- Bullwhip Effect
- Supply Chain Segmentation and Collaboration
- Key Performance Indicators
- Supply Chain Risk Management
- Production Logistics
- Location Planning
- Route Planning

It is intended to provide an interactive format in which students can also contribute (and work alone or in groups). Since logistics and supply chain management requires working in an international environment and therefore many terms are derived from English, the lecture will be held in English.

Plenary: The plenary sessions take place on Mondays from 09:45 - 13:00 and from 14:00 - 17:15.

Exercises: There are a total of five exercise sessions, which take place on Thursdays from 14:00 to 15:30. The dates can be found in the schedule in Ilias.

Examination dates: This is a "Prüfungsleistung anderer Art", consisting of a written and an oral part. The written exam is planned on 14th August 2024 from 8:00 am to 9:00 am. The oral examinations are expected to take place the two weeks before, i.e. in calendar weeks 31 and 32. An oral examination lasts 20 minutes.


Contact person: In the summer semester 2024, the contact persons for organisational matters are Maximilian Barlang and Alexander Ernst. Please contact us at [log-scm@ifl.kit.edu](mailto:log-scm@ifl.kit.edu)

T

## 8.143 Course: Logistics and Supply Chain Management [T-WIWI-102870]

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101437 - Industrial Production I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each summer term	2

Events					
ST 2024	2581996	<a href="#">Logistics and Supply Chain Management</a>	2 SWS	Lecture / 	Schultmann, Rosenberg
Exams					
ST 2024	7981996	<a href="#">Logistics and Supply Chain Management</a>			Schultmann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

The assessment consists of an oral (30 minutes) or written exam (60 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

### Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-MACH-110771 - Logistics and Supply Chain Management](#) must not have been started.

Below you will find excerpts from events related to this course:

V

### Logistics and Supply Chain Management

2581996, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

Students are introduced to the methods and tools of logistics and supply chain management. They students learn the key terms and components of supply chains together with key economic trade-offs. In detail, students gain knowledge of decisions in supply chain management, such as facility location, supply chain planning, inventory management, pricing and supply chain cooperation. In this manner, students will gain knowledge in analyzing, designing and steering of decisions in the domain of logistics and supply chain management.

- Introduction: Basic terms and concepts
- Facility location and network optimization
- Supply chain planning I: flexibility
- Supply chain planning II: forecasting
- Inventory management & pricing
- Supply chain coordination I: the Bullwhip-effect
- Supply chain coordination II: double marginalization
- Supply chain risk management

### Literature

Wird in der Veranstaltung bekannt gegeben.

T

## 8.144 Course: Machine Tools and High-Precision Manufacturing Systems [T-MACH-110963]

**Responsible:** Prof. Dr.-Ing. Jürgen Fleischer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101286 - Machine Tools and Industrial Handling](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	9	Grade to a third	Each winter term	2

Events					
WT 24/25	2149910	<a href="#">Machine Tools and High-Precision Manufacturing Systems</a>	6 SWS	Lecture / Practice (/)	Fleischer
Exams					
ST 2024	76-T-MACH-110963-WING	<a href="#">Machine Tools and High-Precision Manufacturing Systems</a>			Fleischer
WT 24/25	76-T-MACH-110963-WING	<a href="#">Machine Tools and High-Precision Manufacturing Systems</a>			Fleischer

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

Oral exam (approx. 45 minutes)

### Prerequisites

T-MACH-102158 - Machine Tools and Industrial Handling must not be commenced.

T-MACH-109055 - Machine Tools and Industrial Handling must not be commenced.

T-MACH-110962 - Machine Tools and High-Precision Manufacturing Systems must not be commenced.

Below you will find excerpts from events related to this course:

V

### Machine Tools and High-Precision Manufacturing Systems

2149910, WS 24/25, 6 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)  
On-Site

**Content**

The lecture gives an overview of the construction, use and application of machine tools and high-precision manufacturing systems. In the course of the lecture a well-founded and practice-oriented knowledge for the selection, design and evaluation of machine tools and high-precision manufacturing systems is conveyed. First, the main components of the systems are systematically explained and their design principles as well as the integral system design are discussed. Subsequently, the use and application of machine tools and high-precision manufacturing systems will be demonstrated using typical machine examples. Based on examples from current research and industrial applications, the latest developments are discussed, especially concerning the implementation of Industry 4.0 and artificial intelligence.

Guest lectures from industry round off the lecture with insights into practice.

The individual topics are:

- Structural components of dynamic manufacturing Systems
- Feed axes: High-precision positioning
- Spindles of cutting machine Tools
- Peripheral Equipment
- Machine control unit
- Metrological Evaluation
- Maintenance strategies and condition Monitoring
- Process Monitoring
- Development process for machine tools and high-precision manufacturing Systems
- Machine examples

**Learning Outcomes:**

The students ...

- are able to assess the use and application of machine tools and high-precision manufacturing systems and to differentiate between them in terms of their characteristics and design.
- can describe and discuss the essential elements of machine tools and high-precision manufacturing systems (frame, main spindle, feed axes, peripheral equipment, control unit).
- are able to select and dimension the essential components of machine tools and high-precision manufacturing systems.
- are capable of selecting and evaluating machine tools and high-precision manufacturing systems according to technical and economic criteria.

**Workload:****MACH:**

regular attendance: 63 hours

self-study: 177 hours

**WING/TVWL:**

regular attendance: 63 hours

self-study: 207 hours

**Organizational issues**

Vorlesungstermine montags und mittwochs, Übungstermine donnerstags.

Bekanntgabe der konkreten Übungstermine erfolgt in der ersten Vorlesung.

Lectures on Mondays and Wednesdays, tutorial on Thursdays.

The tutorial dates will announced in the first lecture.

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (<https://www.karlsruher-forschungsfabrik.de>) unterstützt.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (<https://www.karlsruher-forschungsfabrik.de/en.html>) to deepen the acquired knowledge.

**Literature****Medien:**

Skript zur Veranstaltung wird über Ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**



Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).





T

**8.145 Course: Macroeconomic Theory [T-WIWI-109121]**

**Responsible:** Prof. Dr. Johannes Brumm  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101501 - Economic Theory](#)  
[M-WIWI-101668 - Economic Policy I](#)  
[M-WIWI-106472 - Advanced Macroeconomics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2560404	<a href="#">Macroeconomic Theory</a>	2 SWS	Lecture / 	Brumm
WT 24/25	2560405	<a href="#">Übung zu Macroeconomic Theory</a>	1 SWS	Practice / 	Pegorari
Exams					
ST 2024	7900162	<a href="#">Macroeconomic Theory</a>			Brumm

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

**Prerequisites**

None.

Below you will find excerpts from events related to this course:

V

**Macroeconomic Theory**

2560404, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

This course introduces a modern approach to macroeconomics by building on microeconomic principles. To be able to rigorously address key macroeconomic questions a general framework based on intertemporal decision making is introduced. Starting by the principles of consumer and firm behavior, this framework is successively expanded by introducing market imperfections, monetary factors as well as international trade. With this framework at hand students are able to analyze labor market policies, government deficits, monetary policy, trade policy, and other important macroeconomic problems. Throughout the course, we not only point out the power of theory but also its limitations.

**Literature**

Literatur und Skripte werden in der Veranstaltung angegeben.

T

**8.146 Course: Macroeconomics: Theory and Computation [T-WIWI-112735]**

**Responsible:** Prof. Dr. Johannes Brumm  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-106472 - Advanced Macroeconomics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	Each term	1

**Competence Certificate**

The assessment of success takes place in the form of an overall examination of 9 LP on the course Macroeconomic Theory and the course Computational Macroeconomics. The duration of the overall examination is 120 minutes. The examination is offered every semester and can be repeated at any regular examination date.

**Annotation**

Teaching and learning format: Lecture and exercise

T

**8.147 Course: Macro-Finance [T-WIWI-106194]**

**Responsible:** Prof. Dr. Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103120 - Financial Economics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Irregular	2

**Competence Certificate**

The grade is based on an exam. The exam covers all the material that is taught in the current semester. The exam takes place in the last week of the lecture-free period. Students who fail the exam are allowed to retake it in the following semester (last week of the respective lecture-free period).

**Prerequisites**

None.

**Recommendation**

None

**Annotation**

Teaching and learning format: Lecture and exercise



T

## 8.148 Course: Management Accounting 1 [T-WIWI-102800]

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101498 - Management Accounting](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2024	2579900	<a href="#">Management Accounting 1</a>	2 SWS	Lecture / 📺	Wouters
ST 2024	2579901	<a href="#">Tutorial Management Accounting 1 (Bachelor)</a>	2 SWS	Practice / 🎧	Dickemann
ST 2024	2579902	<a href="#">Tutorial Management Accounting 1 (Master)</a>	2 SWS	Practice / 🎧	Dickemann
Exams					
ST 2024	79-2579900-B	<a href="#">Management Accounting 1 (Bachelor)</a>	Wouters		
ST 2024	79-2579900-M	<a href="#">Management Accounting 1 (Mastervorzug und Master)</a>	Wouters		

Legend: 📺 Online, 🎧 Blended (On-Site/Online), 🎧 On-Site, ✕ Cancelled

**Competence Certificate**

The assessment consists of a written exam (120 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

**Recommendation**

We recommend that you take part in our exercise for the lecture.

**Annotation**

The exercise is offered separately for Bachelor's students as well as for students in the Master's transfer and Master's program.

Note for exam registration:

- Bachelor students: 79-2579900-B Management Accounting 1 (Bachelor)
- Students in the Master's transfer and Master's program: 79-2579900-M Management Accounting 1 (Master's transfer and Master)

Below you will find excerpts from events related to this course:

V

**Management Accounting 1**

2579900, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
Online

**Content**

The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA1 are: short-term planning, investment decisions, budgeting and activity-based costing.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

**Learning objectives:**

- Students have an understanding of theory and applications of management accounting topics.
- They can use financial information for various purposes in organizations.

**Examination:**

- The assessment consists of a written exam (120 minutes) at the end of each semester (following § 4 (2) No. 1 of the examination regulation).

**Workload:**

- The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Publisher: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- In addition, several papers that will be available on ILIAS.

**Tutorial Management Accounting 1 (Bachelor)**

2579901, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)  
On-Site

**Content**

see Module Handbook

**Tutorial Management Accounting 1 (Master)**

2579902, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)  
On-Site

**Content**

see Module Handbook

**8.149 Course: Management Accounting 2 [T-WIWI-102801]**

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101498 - Management Accounting](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2579903	<a href="#">Management Accounting 2</a>	2 SWS	Lecture /	Wouters
WT 24/25	2579904	<a href="#">Tutorial Management Accounting 2 (Bachelor)</a>	2 SWS	Practice /	Letmathe
WT 24/25	2579905	<a href="#">Tutorial Management Accounting 2 (Master)</a>	2 SWS	Practice /	Letmathe
Exams					
ST 2024	79-2579903-B	<a href="#">Management Accounting 2 (Bachelor)</a>	Wouters		
ST 2024	79-2579903-M	<a href="#">Management Accounting 2 (Mastervorzug und Master)</a>	Wouters		
ST 2024	79-2579903-M-mdlPr	<a href="#">Management Accounting 2 (Master)</a>	Wouters		

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (120 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

**Prerequisites**

None

**Recommendation**

It is recommended:

- to take part in the course "Management Accounting1" before this course
- participation in the exercise for the lecture "Management Accounting 2"

**Annotation**

The exercise for the lecture is offered separately for Bachelor's students as well as for students in the Master's transfer and Master's program.

Note for exam registration: Bachelor students:

- 79-2579903-B Management Accounting 2 (Bachelor)
- Students in the Master's transfer and Master's program: 79-2579903-M Management Accounting 2 (Master's transfer and Master)

Below you will find excerpts from events related to this course:

**Management Accounting 2**

2579903, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
Online

**Content**

The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA2 are: cost estimation, product costing and cost allocation, financial performance measures, transfer pricing, strategic performance measurement systems.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

**Learning objectives:**

- Students have an understanding of theory and applications of management accounting topics. They can use financial information for various purposes in organizations.

**Recommendations:**

- It is recommended to take part in the course "Management Accounting 1" before this course.

**Examination:**

- The assessment consists of a written exam (120 min) at the end of each semester (following § 4 (2) No. 1 of the examination regulation).

**Workload:**

- The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Verlag: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- Zusätzlich werden Artikel auf ILIAS zur Verfügung gestellt.

**Tutorial Management Accounting 2 (Bachelor)**

2579904, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)  
On-Site

**Content**  
see ILIAS

**Tutorial Management Accounting 2 (Master)**

2579905, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)  
On-Site

**Content**  
see ILIAS

**8.150 Course: Management and Marketing [T-WIWI-111594]**

**Responsible:** Prof. Dr. Martin Klarmann  
 Prof. Dr. Hagen Lindstädt  
 Prof. Dr. Petra Nieken  
 Prof. Dr. Orestis Terzidis

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-105768 - Management and Marketing](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	2

Events					
WT 24/25	2600023	<a href="#">Management</a>	2 SWS	Lecture /	Nieken, Lindstädt, Terzidis
WT 24/25	2610026	<a href="#">Marketing</a>	2 SWS	Lecture /	Klarmann
Exams					
ST 2024	7900184	<a href="#">Management and Marketing</a>			Nieken, Terzidis, Klarmann
WT 24/25	7900012	<a href="#">Management and Marketing</a>			Nieken, Terzidis, Klarmann, Lindstädt

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Written exam (90 min) on the two courses "Management" and "Marketing". The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

**Prerequisites**

None

Below you will find excerpts from events related to this course:

**Marketing**

2610026, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Literature**

Ausführliche Literaturhinweise werden in den Materialien zur Vorlesung gegeben.

T

## 8.151 Course: Managing Organizations [T-WIWI-102630]

**Responsible:** Prof. Dr. Hagen Lindstädt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101425 - Strategy and Organization](#)


**Type**  
Written examination

**Credits**  
3,5

**Grading scale**  
Grade to a third

**Recurrence**  
Each winter term

**Version**  
4

Events					
WT 24/25	2577902	<a href="#">Managing Organizations</a>	2 SWS	Lecture / 	Lindstädt
Exams					
ST 2024	7900066	<a href="#">Managing Organizations</a>			Lindstädt
WT 24/25	7900049	<a href="#">Managing Organizations</a>			Lindstädt

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment will consist of a written exam (60 min) taking place at the beginning of the recess period (according to Section 4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

Below you will find excerpts from events related to this course:

V

**Managing Organizations**

2577902, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

This course enables participants to make a sound assessment of existing organizational structures and regulations. Students learn concepts and models for designing organizational structures, regulating organizational processes, and managing organizational change.

Through intensive exposure to real-world case studies, students are encouraged to learn and apply strategic actions in real-world business settings. The course features an action-oriented approach and provides students with a realistic understanding of the possibilities and limitations of rational design approaches.

Content in Keywords:

- Fundamentals of organizational management: fundamental concepts and theoretical background knowledge
- Management of organizational structures and processes: Corporate headquarters, departmental organization, instruction structure and incentive systems
- Ideal organizational structures: organic vs. mechanistic, Mintzberg's types, relationship to strategy and 7S model
- Management of organizational change (change management): Change processes within an organization, management of revolutionary change

**Structure:**

Lectures in the course are available to students online as recordings, while class dates are reserved for active discussion of real-world case studies.

**Learning Objectives:**

Upon completion of the course, students will be able to,

- critically evaluate existing organizational structures and regulations
- compare alternative structural options in a practical setting and evaluate and interpret their effectiveness and efficiency
- analyze and evaluate change processes in organizational management
- apply theoretical knowledge in practical situations

**Recommendations:**

None.

**Workload:**

- Total workload for 3.5 credit points: approx. 105 hours
- Attendance time: 30 hours
- Self-study: 75 hours

**Verification:**

The assessment of success takes place in the form of a written examination (60min.) (according to §4(2), 1 SPO) at the beginning of the lecture-free period of the semester. The examination is offered every semester and can be repeated at any regular examination date.

A bonus can be earned through successful participation in the exercise. If the grade on the written exam is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the lecture.

**Literature**

- Laux, H.; Liermann, F.: *Grundlagen der Organisation*, Springer. 6. Aufl. Berlin 2005.
- Lindstädt, H.: *Organisation*, in Scholz, C. (Hrsg.): *Vahlens Großes Personallexikon*, Verlag Franz Vahlen. 1. Aufl. München, 2009.
- Schreyögg, G.: *Organisation. Grundlagen moderner Organisationsgestaltung*, Gabler. 4. Aufl. Wiesbaden 2003.

Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.

**8.152 Course: Managing the Marketing Mix [T-WIWI-102805]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101424 - Foundations of Marketing](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each summer term	2

Events					
ST 2024	2571152	<a href="#">Managing the Marketing Mix</a>	2 SWS	Lecture /	Klarmann
ST 2024	2571153	<a href="#">Übung zu Marketing Mix (Bachelor)</a>	1 SWS	Practice /	Gerlach, Daumann
Exams					
ST 2024	7900023	<a href="#">Managing the Marketing Mix</a>			Klarmann

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment of success takes place through the preparation and presentation of a case study (max. 30 points) as well as a written exam with additional aids in the sense of an open book exam (max. 60 points). In total, a maximum of 90 points can be achieved in the course. Further details will be announced during the lecture.

**Prerequisites**

None

**Annotation**

The course is compulsory in the module "Foundations of Marketing".  
 For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

Below you will find excerpts from events related to this course:

**Managing the Marketing Mix**

2571152, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The content of this course concentrates on the elements of the marketing mix. Therefore the main chapters are brand management, pricing, promotion and sales management.

For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

This course is compulsory within or the module "Foundations of Marketing" and must be examined.

**Learning objectives:**

student

- know the meaning of the branding, the brand positioning and the possibilities of the brand value calculation
- understand the price behavior of customers and can apply this knowledge to the practice  
know different methods for price determination (conjoint analysis, cost-plus determination, target costing, customer surveys, bidding procedures) and price differentiation
- are able to name and explain the relevant communication theories
- can identify crisis situations and formulate appropriate response strategies
- can name and judge different possibilities of the Intermediaplanung
- know various design elements of advertising communication
- understand the measurement of advertising impact and can apply it
- know the basics of sales organization
- are able to evaluate basic sales channel decisions

**Workload:**

The total workload for this course is approximately 135.0 hours.

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.








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## 8.153 Course: Manufacturing Measurement Technology [T-ETIT-106057]

**Responsible:** Prof. Dr.-Ing. Michael Heizmann**Organisation:** KIT Department of Electrical Engineering and Information Technology**Part of:** [M-ETIT-106581 - Measurement, Control, and Manufacturing Measurement Technology](#)


Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each summer term	1





Events					
ST 2024	2302116	<a href="#">Fertigungsmesstechnik</a>	2 SWS	Lecture / 	Heizmann
Exams					
ST 2024	7302116	<a href="#">Manufacturing Measurement Technology</a>			Heizmann
WT 24/25	7302116	<a href="#">Manufacturing Measurement Technology</a>			Heizmann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

**8.154 Course: Manufacturing Technology [T-MACH-102105]****Responsible:** Prof. Dr.-Ing. Volker Schulze**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101276 - Manufacturing Technology](#)**Type**  
Written examination**Credits**  
9**Grading scale**  
Grade to a third**Recurrence**  
Each winter term**Version**  
3

Events					
WT 24/25	2149657	<a href="#">Manufacturing Technology</a>	6 SWS	Lecture / Practice (/  )	Schulze
Exams					
ST 2024	76-T-MACH-102105	<a href="#">Manufacturing Technology</a>			Schulze
WT 24/25	76-T-MACH-102105	<a href="#">Manufacturing Technology</a>			Schulze

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Written Exam (180 min)

**Prerequisites**

none

*Below you will find excerpts from events related to this course:*

V

**Manufacturing Technology**2149657, WS 24/25, 6 SWS, Language: German, [Open in study portal](#)Lecture / Practice (VÜ)  
Blended (On-Site/Online)

**Content**

The objective of the lecture is to look at manufacturing technology within the wider context of production engineering, to provide an overview of the different manufacturing processes and to impart detailed process knowledge of the common processes. The lecture covers the basic principles of manufacturing technology and deals with the manufacturing processes according to their classification into main groups regarding technical and economic aspects. The lecture is completed with topics such as process chains in manufacturing.

The following topics will be covered:

- Quality control
- Primary processing (casting, plastics engineering, sintering, additive manufacturing processes)
- Forming (sheet-metal forming, massive forming, plastics engineering)
- Cutting (machining with geometrically defined and geometrically undefined cutting edges, separating, abrading)
- Joining
- Coating
- Heat treatment and surface treatment
- Process chains in manufacturing

This lecture provides an excursion to an industry company.

**Learning Outcomes:**

The students ...

- are capable to specify the different manufacturing processes and to explain their functions.
- are able to classify the manufacturing processes by their general structure and functionality according to the specific main groups.
- have the ability to perform a process selection based on their specific characteristics.
- are enabled to identify correlations between different processes and to select a process regarding possible applications.
- are qualified to evaluate different processes regarding specific applications based on technical and economic aspects.
- are experienced to classify manufacturing processes in a process chain and to evaluate their specific influence on surface integrity of workpieces regarding the entire process chain.

**Workload:**

regular attendance: 63 hours

self-study: 177 hours

**Organizational issues**

Vorlesungstermine montags und dienstags, Übungstermine mittwochs.

Bekanntgabe der konkreten Übungstermine erfolgt in der ersten Vorlesung.

Die LV wird letztmalig im WS 2024/25 angeboten (Vorlesungsvideos bleiben online).

Die Prüfung wird für Erstsreiber letztmalig im SS 2025 und Wiederholer letztmalig im WS 2025/26 angeboten.

**Literature****Medien:**

Skript zur Veranstaltung wird über ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in ilias (<https://ilias.studium.kit.edu/>).


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


**8.155 Course: Material Science II for Business Engineers [T-MACH-102079]**

**Responsible:** Dr.-Ing. Susanne Wagner  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101261 - Emphasis in Fundamentals of Engineering](#)  
[M-MACH-101262 - Emphasis Materials Science](#)  
[M-WIWI-101839 - Additional Fundamentals of Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	1

Events					
ST 2024	2126782	<a href="#">Materials Science II for Business Engineers</a>	2 SWS	Lecture / 	Wagner
Exams					
ST 2024	76-T-MACH-102079	<a href="#">Material Science II for Business Engineers</a>			Wagner, Schell, Bucharsky
WT 24/25	76-T-MACH-102079	<a href="#">Material Science II</a>			Wagner, Schell, Bucharsky

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled


**Competence Certificate**

The assessment consists of a written examination (150 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place every semester. Re-examinations are offered at every ordinary examination date. The examination at the end of the winter term is carried out by a written or oral exam.

**Prerequisites**

The module *Material Science* has to be completed beforehand.

Below you will find excerpts from events related to this course:

	<b>Materials Science II for Business Engineers</b> 2126782, SS 2024, 2 SWS, Language: German, <a href="#">Open in study portal</a>	Lecture (V) On-Site
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**Literature****Weiterführende Literatur:**

- Werkstoffwissenschaften - Eigenschaften, Vorgänge, Technologien, B. Ilscher, Springer – Verlag, Berlin Heidelberg New York, ISBN 3-540-10725-5
- Werkstoffwissenschaften, Schatt, Werner / Worch, Hartmut (Hrsg.) Wiley-VCH, Weinheim, ISBN-10: 3-527-30535-1
- Metallkunde für das Maschinenwesen I/II, K.G. Schmitt-Thomas, Springer-Verlag, ISBN 3-540-51913-0
- Materials Science and Engineering – An Introduction, William D. Callister (Jr.), John Wiley & Son, ISBN-10: 978-0-471-73696-7


T





## 8.156 Course: Materials Science I [T-MACH-102078]

**Responsible:** Dr.-Ing. Susanne Wagner  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101260 - Materials Science](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each winter term	1

Events					
WT 24/25	2125760	<a href="#">Materials Science I</a>	2 SWS	Lecture / 	Wagner
Exams					
ST 2024	76-T-MACH-102078	<a href="#">Materials Science I</a>			Wagner, Schell, Bucharsky
WT 24/25	76-T-MACH-102078	<a href="#">Materials Science I</a>			Wagner, Schell, Bucharsky

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

The assessment consists of a written examination (150 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place every semester. Re-examinations are offered at every ordinary examination date. The examination at the end of the summer term is carried out by a written or oral exam.

### Prerequisites

None

Below you will find excerpts from events related to this course:

V

### Materials Science I

2125760, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
Blended (On-Site/Online)

### Literature

#### Weiterführende Literatur:

Werkstoffwissenschaften - Eigenschaften, Vorgänge, Technologien, B. Ilischer, Springer - Verlag, Berlin Heidelberg New York, ISBN 3-540-10725-5

Werkstoffwissenschaften, Schatt, Werner / Worch, Hartmut (Hrsg.) Wiley-VCH, Weinheim, ISBN-10: 3-527-30535-1

Metallkunde für das Maschinenwesen I/II, K.G. Schmitt-Thomas, Springer-Verlag, ISBN 3-540-51913-0

Materials Science and Engineering - An Introduction, William D. Callister (Jr.), John Wiley & Son, ISBN-10: 978-0-471-73696-7 .

T

## 8.157 Course: Mathematics I - Final Exam [T-MATH-111493]

**Responsible:** Prof. Dr. Daniel Hug  
 Prof. Dr. Günter Last  
 Dr. Franz Nestmann  
 PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-MATH-105754 - Mathematics 1](#)

Type	Credits	Grading scale	Version
Written examination	5	Grade to a third	1

Exams			
ST 2024	7700050	<a href="#">Mathematics I - Final Exam</a>	Winter, Nestmann, Last

T

## 8.158 Course: Mathematics I - Midterm Exam [T-MATH-111492]

**Responsible:** Prof. Dr. Daniel Hug  
 Prof. Dr. Günter Last  
 Dr. Franz Nestmann  
 PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-MATH-105754 - Mathematics 1](#)

Type	Credits	Grading scale	Version
Written examination	5	Grade to a third	1

Exams			
ST 2024	7700053	<a href="#">Mathematics I - Midterm Exam</a>	Winter, Nestmann, Last

T

## 8.159 Course: Mathematics II - Final Exam [T-MATH-111496]

**Responsible:** Prof. Dr. Daniel Hug  
 Prof. Dr. Günter Last  
 Dr. Franz Nestmann  
 PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-MATH-105756 - Mathematics 2](#)

Type	Credits	Grading scale	Version
Written examination	3,5	Grade to a third	1

Exams			
ST 2024	00022	<a href="#">Mathematics II - Final Exam</a>	Nestmann, Winter, Last
WT 24/25	00021	<a href="#">Mathematics II - Final Exam</a>	Nestmann, Winter, Last



T

## 8.160 Course: Mathematics II - Midterm Exam [T-MATH-111495]

**Responsible:** Prof. Dr. Daniel Hug  
 Prof. Dr. Günter Last  
 Dr. Franz Nestmann  
 PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-MATH-105756 - Mathematics 2](#)

Type	Credits	Grading scale	Version
Written examination	3,5	Grade to a third	1

Exams			
ST 2024	00021	<a href="#">Mathematics II - Midterm Exam</a>	Last, Winter, Nestmann
WT 24/25	00020	<a href="#">Mathematics II - Midterm Exam</a>	Nestmann, Winter, Last

T

## 8.161 Course: Mathematics III - Final Exam [T-MATH-111498]

**Responsible:** Prof. Dr. Daniel Hug  
 Prof. Dr. Günter Last  
 Dr. Franz Nestmann  
 PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-MATH-105757 - Mathematics 3](#)

Type	Credits	Grading scale	Version
Written examination	4	Grade to a third	1

Exams			
ST 2024	7700064	<a href="#">Mathematics III - Final Exam</a>	Nestmann, Winter, Last

T

**8.162 Course: Measurement and Control Technology [T-ETIT-112852]**

**Responsible:** Prof. Dr.-Ing. Michael Heizmann  
Prof. Dr.-Ing. Sören Hohmann

**Organisation:** KIT Department of Electrical Engineering and Information Technology

**Part of:** [M-ETIT-106581 - Measurement, Control, and Manufacturing Measurement Technology](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	6	Grade to a third	Each summer term	1 terms	1

**Competence Certificate**

The assessment of success takes place in the form of a written examination lasting 120 minutes. The module grade is the grade of the written examination.

**Prerequisites**

none

**8.163 Course: Mechanical Design A [T-MACH-112984]****Responsible:** Prof. Dr.-Ing. Sven Matthiesen**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106527 - Mechanical Design A](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	7	Grade to a third	Each winter term	1 terms	2

Events					
WT 24/25	2145170	<a href="#">Mechanical Design A</a>	3 SWS	Lecture /	Matthiesen, Düser
WT 24/25	2145194	<a href="#">Tutorial for Mechanical Design A</a>	1 SWS	Practice /	Matthiesen, Düser
Exams					
ST 2024	76T-MACH-112984	<a href="#">Mechanical Design A</a>			Matthiesen, Düser
WT 24/25	76-T-MACH-112984	<a href="#">Mechanical Design A</a>			Matthiesen, Düser

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Written exam with a duration of 90 Minutes

**Prerequisites**

Admission to the exam only with successful completion of Workshop Mechanical Design A (T-MACH-112981)

**Recommendation**

None

**Annotation**

Students are familiar with the basic machine elements of technical systems and are able to analyze them in a system context

Below you will find excerpts from events related to this course:

**Mechanical Design A**2145170, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)**Lecture (V)**  
On-Site**Content**

Students are introduced to fundamental topics in Mechanical Design A. The focus is on the analysis of existing systems and the development of knowledge for fundamental elements and functionality of technical systems. The course is divided into the following topics:

- Springs
- Technical systems
- Bearings
- Seals
- Component connection
- Gearbox

**Literature**

- Grundlagen der Berechnung und Gestaltung von Maschinenelementen; Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X oder Volltextzugriff über Uni-Katalog der Universitätsbibliothek
- Grundlagen von Maschinenelementen für Antriebsaufgaben; Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8

**Tutorial for Mechanical Design A**2145194, WS 24/25, 1 SWS, Language: German, [Open in study portal](#)**Practice (Ü)**  
On-Site

**Content**

Specific applications and tasks in the subject areas of MKL A:

- Springs
- Technical systems
- Bearings
- Seals
- Component connection
- Gearbox

**Literature**


Grundlagen der Berechnung und Gestaltung von Maschinenelementen; Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X  
oder Volltextzugriff über Uni-Katalog der Universitätsbibliothek





Grundlagen von Maschinenelementen für Antriebsaufgaben; Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8

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**8.164 Course: Mechanical Design A, Workshop [T-MACH-112981]****Responsible:** Prof. Dr.-Ing. Sven Matthiesen**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106527 - Mechanical Design A](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	2	pass/fail	Each winter term	1 terms	2

Events					
WT 24/25	2145171	<a href="#">Mechanical Design A - Workshop</a>	1 SWS	Practical course / 	Matthiesen, Düser
Exams					
WT 24/25	76-T-MACH-112981	<a href="#">Mechanical Design A, Workshop</a>			Düser, Matthiesen

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Concomitant to the lecture, a workshop with 3 workshop sessions takes place over the semester. During the workshop the students are divided into groups and their mechanical design knowledge will be tested during a colloquium at the beginning of every single workshop session. The attendance is mandatory and will be controlled.

The pass of the colloquia and the process of the workshop task are required for the successful participation.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

Below you will find excerpts from events related to this course:

V

**Mechanical Design A - Workshop**2145171, WS 24/25, 1 SWS, Language: German, [Open in study portal](#)**Practical course (P)  
On-Site****Content**

In addition to the MD A lecture, the students are familiarized with the design process in a series of three workshops. The focus here is on application-oriented learning and understanding. For example, the students independently disassemble and assemble small demonstrator systems and thus gain a better understanding of the relevant problems in the field of mechanical design.

**Organizational issues**

Dauer eines Workshop Slots: 1,5 h (Informationen zu den Terminen und der Anmeldung im MKL A ILIAS Kurs)

**Literature**

- Grundlagen der Berechnung und Gestaltung von Maschinenelementen; Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X oder Volltextzugriff über Uni-Katalog der Universitätsbibliothek
- Grundlagen von Maschinenelementen für Antriebsaufgaben; Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8

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## 8.165 Course: Mechatronical Systems and Products (mach/etit/wiwi) [T-MACH-112647]




**Responsible:** Prof. Dr.-Ing. Sören Hohmann  
Prof. Dr.-Ing. Sven Matthiesen

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106236 - Mechatronic Product Design](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each winter term	2

Events					
WT 24/25	2303003	<a href="#">Exercises for 2303161 Mechatronical Systems and Products</a>	1 SWS	Practice / 	Matthiesen, Hohmann
WT 24/25	2303161	<a href="#">Mechatronical Systems and Products</a>	2 SWS	Lecture / 	Matthiesen, Hohmann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

written exam (60 min)


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


**8.166 Course: Metal Forming [T-MACH-105177]**

**Responsible:** Prof. Dr.-Ing. Thomas Herlan  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	2

Events					
ST 2024	2150681	<a href="#">Metal Forming</a>	2 SWS	Lecture / 	Herlan
Exams					
ST 2024	76-T-MACH-105177	<a href="#">Metal Forming</a>			Herlan

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Oral Exam (20 min)

**Prerequisites**

none

Below you will find excerpts from events related to this course:

V

**Metal Forming**

2150681, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site



**Content**

At the beginning of the lecture the basics of metal forming are briefly introduced. The focus of the lecture is on massive forming (forging, extrusion, rolling) and sheet forming (car body forming, deep drawing, stretch drawing). This includes the systematic treatment of the appropriate metal forming Machines and the corresponding tool technology. Aspects of tribology, as well as basics in material science and aspects of production planning are also discussed briefly. The plastic theory is presented to the extent necessary in order to present the numerical simulation method and the FEM computation of forming processes or tool design. The lecture will be completed by product samples from the forming technology.

The topics are as follows:

- Introduction and basics
- Hot forming
- Metal forming machines
- Tools
- Metallographic fundamentals
- Plastic theory
- Tribology
- Sheet forming
- Extrusion
- Numerical simulation

**Learning Outcomes:**

The students ...

- are able to reflect the basics, forming processes, tools, Machines and equipment of metal forming in an integrated and systematic way.
- are capable to illustrate the differences between the forming processes, tools, machines and equipment with concrete examples and are qualified to analyze and assess them in terms of their suitability for the particular application.
- are also able to transfer and apply the acquired knowledge to other metal forming problems.

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Organizational issues**

Vorlesungstermine freitags, wöchentlich.

Die konkreten Termine werden in der ersten Vorlesung bekannt gegeben und auf der Institutshomepage und ILIAS veröffentlicht.

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (<https://www.karlsruher-forschungsfabrik.de>) unterstützt.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (<https://www.karlsruher-forschungsfabrik.de/en.html>) to deepen the acquired knowledge.

**Literature****Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>)

**8.167 Course: Microactuators [T-MACH-101910]**

**Responsible:** Prof. Dr. Manfred Kohl  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each summer term	2

Events					
ST 2024	2142881	<a href="#">Microactuators</a>	2 SWS	Lecture /	Kohl
Exams					
ST 2024	76-T-MACH-101910	<a href="#">Microactuators</a>			Kohl
WT 24/25	76-T-MACH-101910	<a href="#">Microactuators</a>			Kohl

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

written exam, 60 min.

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**Microactuators**

2142881, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

- Basic knowledge in the material science of the actuation principles
- Layout and design optimization
- Fabrication technologies
- Selected developments
- Applications

The lecture includes amongst others the following topics:

- Microelectromechanical systems: linear actuators, microrelais, micromotors
- Medical technology and life sciences: Microvalves, micropumps, microfluidic systems
- Microrobotics: Microgrippers, polymer actuators (smart muscle)
- Information technology: Optical switches, mirror systems, read/write heads

**Literature**

- Folienskript "Mikroaktorik"
- D. Jendritza, Technischer Einsatz Neuer Aktoren: Grundlagen, Werkstoffe, Designregeln und Anwendungsbeispiele, Expert-Verlag, 3. Auflage, 2008
- M. Kohl, Shape Memory Microactuators, M. Kohl, Springer-Verlag Berlin, 2004
- N.TR. Nguyen, S.T. Wereley, Fundamentals and applications of Microfluidics, Artech House, Inc. 2002
- H. Zappe, Fundamentals of Micro-Optics, Cambridge University Press 2010

## T

## 8.168 Course: Microeconometrics [T-WIWI-112153]

**Responsible:** Prof. Dr. Fabian Krüger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101599 - Statistics and Econometrics](#)  
[M-WIWI-105414 - Statistics and Econometrics II](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	see Annotations	1

Events					
ST 2024	2500012	<a href="#">Tutorial in Microeconometrics</a>	2 SWS	Practice /	Krüger, Eberl
ST 2024	2500032	<a href="#">Microeconometrics</a>	2 SWS	Lecture /	Krüger, Eberl
Exams					
ST 2024	7700082	<a href="#">Microeconometrics</a>			Krüger
WT 24/25	7700004	<a href="#">Microeconometrics</a>			Krüger

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

The assessment consists of a written examination (60 minutes). A bonus can be acquired by successful completion of an assignment (written report + short in-class presentation) during the semester. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4).

### Prerequisites

None

### Recommendation

Students are expected to have a good working knowledge of the linear regression model (e.g. by having attended the course 'Volkswirtschaftslehre III: Einführung in die Ökonometrie', or attending it in the same semester as 'Microeconometrics').

### Annotation

The course will be offered in the summer semester 2024.

Below you will find excerpts from events related to this course:

## V

## Microeconometrics

2500032, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

Microeconometrics is concerned with modeling data from an individual ('micro') unit like a person, household or firm. The response variables of interest are often discrete. For example, a person's type of employment may be coded as a binary variable (e.g. working in IT sector versus not working in IT sector), and a person's choice of transportation mode can be cast as a multinomial variable (e.g. bike, train, car, or other). These examples differ from the basic econometric setting of a continuous response variable, and require nonlinear regression modeling.

The course first introduces maximum likelihood estimation which is particularly useful in microeconometrics. We then discuss econometric models for various types of response variables (binary, ordered, multinomial, censored), as well as methods for estimation and model evaluation. Throughout the course, implementation via R software plays an important role.

Prerequisites: Course participants are expected to have a good working knowledge of the linear regression model (e.g. by having attended the course 'Volkswirtschaftslehre III: Einführung in die Ökonometrie', or attending it in the same semester as 'Microeconometrics').

### Literature

Winkelmann, R., Boes, S. (2006): Analysis of Microdata. Springer.


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


## 8.169 Course: Mobile Machines [T-MACH-105168]

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101267 - Mobile Machines](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	8	Grade to a third	Each summer term	2

Events					
ST 2024	2114073	<a href="#">Mobile Machines</a>	4 SWS	Lecture / 	Geimer, Kazenwadel
Exams					
ST 2024	76-T-MACH-105168	<a href="#">Mobile Machines</a>			Geimer
WT 24/25	76T-MACH-105168	<a href="#">Mobile Machines</a>			Geimer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

The assessment consists of an oral exam (45 min) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

### Prerequisites

none

### Recommendation

Knowledge in Fluid Power Systems is required. It is recommended to attend the course *Fluid Power Systems* [2114093] beforehand.

### Annotation

After completion of the course the students have knowledge of:

- a wide range of mobile machines
- operation modes and working cycles of important mobile machines
- selected subsystems and components

Content:

- Introduction of the required components and machines
- Basics and structure of mobile machines
- Practical insight in the development techniques

Below you will find excerpts from events related to this course:

V

### Mobile Machines

2114073, SS 2024, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

- Introduction of the required components and machines
- Basics of the structure of the whole system
- Practical insight in the development techniques

Knowledge in Fluid Power is required.

### Recommendations:

It is recommended to attend the course *Fluid Power Systems* [2114093] beforehand.

- regular attendance: 42 hours
- self-study: 184 hours

## T

## 8.170 Course: Mobility and Infrastructure [T-BGU-101791]

**Responsible:** Prof. Dr.-Ing. Peter Vortisch

**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences

**Part of:** M-BGU-101067 - Mobility and Infrastructure







**Type**  
Written examination





**Credits**  
9

**Grading scale**  
Grade to a third

**Recurrence**  
Each term

**Version**  
2

Events					
ST 2024	6200404	<a href="#">Spatial Planning and Planning Law</a>	2 SWS	Lecture / 	Wilske
ST 2024	6200405	<a href="#">Exercises to Spatial Planning and Planning Law</a>	1 SWS	Practice / 	Wilske, Mitarbeiter/innen
ST 2024	6200406	<a href="#">Transportation Systems</a>	2 SWS	Lecture / 	Vortisch
ST 2024	6200407	<a href="#">Exercises to Transportation Systems</a>		Practice / 	Vortisch, Mitarbeiter/innen
ST 2024	6200408	<a href="#">Design Basics in Highway Engineering</a>	2 SWS	Lecture / 	Plachkova-Dzhurova, Zimmermann
ST 2024	6200409	<a href="#">Exercises to Design Basics in Highway Engineering</a>		Practice / 	Plachkova-Dzhurova, Zimmermann
Exams					
ST 2024	8234101791	<a href="#">Mobility and Infrastructure</a>			Vortisch

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

written exam, 150 min.

### Prerequisites

None

### Recommendation

For students from the KIT-Department of Economics and Management it is recommended to take part in the excercises.

### Annotation

none

**8.171 Course: Modeling and OR-Software: Introduction [T-WIWI-106199]**

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101413 - Applications of Operations Research](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	4

Events					
ST 2024	2550490	<a href="#">Modellieren und OR-Software: Einführung</a>	3 SWS	Practical course /	Nickel, Linner, Pomes
Exams					
ST 2024	7900153	<a href="#">Modeling and OR-Software: Introduction</a>			Nickel
WT 24/25	7900081	<a href="#">Modeling and OR-Software: Introduction</a>			Nickel

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment is a written examination. The examination is held in every semester.

**Recommendation**

Firm knowledge of the contents from the lecture *Introduction to Operations Research I* [2550040] of the module *Operations Research*.

**Annotation**

Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The lecture is offered in every term. The planned lectures and courses for the next three years are announced online.

Below you will find excerpts from events related to this course:

**Modellieren und OR-Software: Einführung**

2550490, SS 2024, 3 SWS, Language: German, [Open in study portal](#)

**Practical course (P)**  
**Blended (On-Site/Online)**

**Content**

After an introduction to general concepts of modelling tools (implementation, data handling, result interpretation, ...), the software IBM ILOG CPLEX Optimization Studio and the corresponding modeling language OPL will be discussed which can be used to solve OR problems on a computer-aided basis. Subsequently, a broad range of exercises will be discussed. The main goals of the exercises from literature and practical applications are to learn the process of modeling optimization problems as linear or mixed-integer programs, to efficiently utilize the presented tools for solving these optimization problems and to implement heuristic solution procedures for mixed-integer programs.

**Organizational issues**

Die Teilnehmerzahl für diese Veranstaltung ist begrenzt.

Die Bewerbung erfolgt über das [Wiwi-Portal](#).

Der Bewerbungszeitraum ist vom 01.03.24 bis zum 18.03.24.

**8.172 Course: Nonlinear Optimization I [T-WIWI-102724]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)  
[M-WIWI-103278 - Optimization under Uncertainty](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	4

Events					
WT 24/25	2550111	<a href="#">Nonlinear Optimization I</a>	2 SWS	Lecture /	Stein
WT 24/25	2550112	<a href="#">Exercises Nonlinear Optimization I + II</a>		Practice /	Stein, Schwarze
Exams					
ST 2024	7900202_SS2024_NK	<a href="#">Nonlinear Optimization I</a>			Stein
WT 24/25	7900001_WS2425_HK	<a href="#">Nonlinear Optimization I</a>			Stein

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The successful completion of the exercises is required for admission to the written exam. The exam takes place in the semester of the lecture and in the following semester.

The examination can also be combined with the examination of Nonlinear Optimization II [2550113]. In this case, the duration of the written examination takes 120 minutes.

**Prerequisites**

The module component exam T-WIWI-103637 "Nonlinear Optimization I and II" may not be selected.

**Annotation**

Part I and II of the lecture are held consecutively in the *same* semester.

Below you will find excerpts from events related to this course:

**Nonlinear Optimization I**

2550111, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

**Literature**

O. Stein, Grundzüge der Nichtlinearen Optimierung, 2. Aufl., SpringerSpektrum, 2021

**Weiterführende Literatur:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000



**T 8.173 Course: Nonlinear Optimization I and II [T-WIWI-103637]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)

<b>Type</b> Written examination	<b>Credits</b> 9	<b>Grading scale</b> Grade to a third	<b>Recurrence</b> Each winter term	<b>Version</b> 6
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Events					
WT 24/25	2550111	<a href="#">Nonlinear Optimization I</a>	2 SWS	Lecture /	Stein
WT 24/25	2550112	<a href="#">Exercises Nonlinear Optimization I + II</a>		Practice /	Stein, Schwarze
WT 24/25	2550113	<a href="#">Nonlinear Optimization II</a>	2 SWS	Lecture /	Stein
Exams					
ST 2024	7900204_SS2024_NK	<a href="#">Nonlinear Optimization I and II</a>			Stein
WT 24/25	7900003_WS2425_HK	<a href="#">Nonlinear Optimization I and II</a>			Stein

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (120 minutes) according to Section 4(2), 1 of the examination regulation. The successful completion of the exercises is required for admission to the written exam.

The exam takes place in the semester of the lecture and in the following semester.

**Prerequisites**

None.

**Annotation**

Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from events related to this course:

**V Nonlinear Optimization I** **Lecture (V)**  
**On-Site**  
 2550111, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Content**

The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

**Literature**

O. Stein, Grundzüge der Nichtlinearen Optimierung, 2. Aufl., SpringerSpektrum, 2021

**Weiterführende Literatur:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

**Nonlinear Optimization II**

2550113, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions
- Algorithms (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of optimization problems *without* constraints forms the contents of the lecture "Nonlinear Optimization I". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

**Literature**

O. Stein, Grundzüge der Nichtlinearen Optimierung, 2. Aufl., SpringerSpektrum, 2021

**Weiterführende Literatur:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

**8.174 Course: Nonlinear Optimization II [T-WIWI-102725]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	3

Events					
WT 24/25	2550112	<a href="#">Exercises Nonlinear Optimization I + II</a>		Practice /	Stein, Schwarze
WT 24/25	2550113	<a href="#">Nonlinear Optimization II</a>	2 SWS	Lecture /	Stein
Exams					
ST 2024	7900203_SS2024_NK	<a href="#">Nonlinear Optimization II</a>			Stein
WT 24/25	7900002_WS2425_HK	<a href="#">Nonlinear Optimization II</a>			Stein

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The successful completion of the exercises is required for admission to the written exam.

The exam takes place in the semester of the lecture and in the following semester.

The exam can also be combined with the examination of *Nonlinear Optimization I* [2550111]. In this case, the duration of the written exam takes 120 minutes.

**Prerequisites**

None.

**Annotation**

Part I and II of the lecture are held consecutively in the same semester.

Below you will find excerpts from events related to this course:

**Nonlinear Optimization II**

2550113, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions
- Algorithms (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of optimization problems *without* constraints forms the contents of the lecture "Nonlinear Optimization I". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

**Literature**

O. Stein, Grundzüge der Nichtlinearen Optimierung, 2. Aufl., SpringerSpektrum, 2021

**Weiterführende Literatur:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T

## 8.175 Course: Novel Actuators and Sensors [T-MACH-102152]

**Responsible:** Prof. Dr. Manfred Kohl  
Dr. Martin Sommer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)


**Type**  
Written examination





**Credits**  
4

**Grading scale**  
Grade to a third

**Recurrence**  
Each winter term

**Version**  
3

Events					
WT 24/25	2141865	<a href="#">Novel actuators and sensors</a>	2 SWS	Lecture / 	Kohl, Sommer
Exams					
ST 2024	7600010	<a href="#">Novel Actuators and Sensors</a>			Kohl
ST 2024	76-T-MACH-102152	<a href="#">Novel Actuators and Sensors</a>			Sommer, Kohl
WT 24/25	76-T-MACH-102152	<a href="#">Novel Actuators and Sensors</a>			Kohl, Sommer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

#### Competence Certificate

written exam, 60 minutes

#### Prerequisites

none

Below you will find excerpts from events related to this course:

V

#### Novel actuators and sensors

2141865, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

#### Literature



- Vorlesungsskript "Neue Aktoren" und Folienskript "Sensoren"
- Donald J. Leo, Engineering Analysis of Smart Material Systems, John Wiley & Sons, Inc., 2007
- "Sensors Update", Edited by H.Baltes, W. Göpel, J. Hesse, VCH, 1996, ISBN: 3-527-29432-5
- "Multivariate Datenanalyse – Methodik und Anwendungen in der Chemie", R. Henrion, G. Henrion, Springer 1994, ISBN 3-540-58188-X





T

## 8.176 Course: Optimization under Uncertainty [T-WIWI-106545]

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101413 - Applications of Operations Research](#)  
[M-WIWI-103278 - Optimization under Uncertainty](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	3

Events					
WT 24/25	2550464	<a href="#">Optimization Under Uncertainty</a>	2 SWS	Lecture / 	Rebennack
WT 24/25	2550465	<a href="#">Übungen zu Optimierungsansätze unter Unsicherheit</a>	1 SWS	Practice / 	Rebennack
WT 24/25	2550466		2 SWS	Others (sons)	Rebennack
Exams					
ST 2024	7900309	<a href="#">Optimization under Uncertainty</a>			Rebennack
WT 24/25	7900240	<a href="#">Optimization under Uncertainty</a>			Rebennack

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

**Prerequisites**

None.

T

## 8.177 Course: Optoelectronic Components [T-ETIT-101907]

**Responsible:** Prof. Dr.-Ing. Sebastian Randel**Organisation:** KIT Department of Electrical Engineering and Information Technology**Part of:** [M-MACH-101287 - Microsystem Technology](#)



Type
Oral examination



Credits
4

Grading scale
Grade to a third

Recurrence
Each summer term

Version
1

Events					
ST 2024	2309486	<a href="#">Optoelectronic Components</a>	2 SWS	Lecture / 	Randel
ST 2024	2309487	<a href="#">Optoelectronic Components (Tutorial)</a>	1 SWS	Practice / 	Randel
Exams					
ST 2024	7300027	<a href="#">Optoelectronic Components - repetition exam</a>			Randel
ST 2024	7309486	<a href="#">Optoelectronic Components</a>			Randel
WT 24/25	7309486	<a href="#">Optoelectronic Components</a>			Randel

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Prerequisites**

none

**Annotation**

This course is recommended for Master programs. For details, see description of M-ETIT-100509 "Optoelectronic Components".

T

## 8.178 Course: Personnel Policies and Labor Market Institutions [T-WIWI-102908]

**Responsible:** Prof. Dr. Petra Nieken  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101668 - Economic Policy I](#)  
[M-WIWI-106860 - Leadership & Sustainable HR-Management](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2024	2573001	<a href="#">Personnel Policies and Labor Market Institutions</a>	2 SWS	Lecture / 🗣️	Nieken
ST 2024	2573002	<a href="#">Übungen zu Personalpolitik und Arbeitsmarktinstitutionen</a>	1 SWS	Practice / 🗣️	Nieken, Mitarbeiter, Gorny
Exams					
ST 2024	7900133	<a href="#">Personnel Policies and Labor Market Institutions</a>			Nieken
WT 24/25	7900202	<a href="#">Personnel Policies and Labor Market Institutions</a>			Nieken

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✕ Cancelled

### Competence Certificate

The assessment of this course is a written examination of 1 hour. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

In case of a small number of registrations, we might offer an oral exam instead of a written exam.

### Prerequisites

None

### Recommendation

Completion of module Business Administration is recommended.

Basic knowledge of microeconomics, game theory, and statistics is recommended.

Below you will find excerpts from events related to this course:

V

### Personnel Policies and Labor Market Institutions

2573001, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site



**Content**

The students acquire knowledge about the process and the strategic aspects of collective bargaining about wages. They analyze selected aspects of corporate governance and co-determination in Germany. The lecture also addresses questions of personnel politics and labor market discrimination. Microeconomic and behavioral approaches as well as empirical data is used and evaluated critically.

**Aim**

The student

- understands the process and role of agents in collective wage bargaining.
- analyzes strategic decisions in the context of corporate governance.
- understands the concept of co-determination in Germany.
- challenges statements that evaluate certain personnel politics.

**Workload**

The total workload for this course is approximately 135 hours.

Lecture 32 hours

Preparation of lecture 52 hours

Exam preparation 51 hours

**Literature**

Arbeitsmarktökonomik, W. Franz, Springer, 2013

T

**8.179 Course: PH APL-ING-TL01 [T-WIWI-106291]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Once	1

T

**8.180 Course: PH APL-ING-TL02 [T-WIWI-106292]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Once	1

T

**8.181 Course: PH APL-ING-TL03 [T-WIWI-106293]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Once	1

T

**8.182 Course: PH APL-ING-TL04 ub [T-WIWI-106294]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Once	1

T

**8.183 Course: PH APL-ING-TL05 ub [T-WIWI-106295]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Once	1

T

**8.184 Course: PH APL-ING-TL06 ub [T-WIWI-106296]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Once	1

T

**8.185 Course: PH APL-ING-TL07 [T-WIWI-108384]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Once	1



T

**8.186 Course: Physical Basics of Laser Technology [T-MACH-102102]****Responsible:** Dr.-Ing. Johannes Schneider**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	5	Grade to a third	Each winter term	4

Events					
WT 24/25	2181612	<a href="#">Physical basics of laser technology</a>	3 SWS	Lecture / Practice (/)	Schneider
Exams					
ST 2024	76-T-MACH-102102	<a href="#">Physical Basics of Laser Technology</a>			Schneider
WT 24/25	76-T-MACH-102102	<a href="#">Physical Basics of Laser Technology</a>			Schneider

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

oral examination (30 min)

no tools or reference materials

**Prerequisites**

It is not possible, to combine this brick with brick Laser Material Processing [T-MACH-112763], brick Laser Application in Automotive Engineering [T-MACH-105164] and brick Physical Basics of Laser Technology [T-MACH-109084]

**Recommendation**

Basic knowledge of physics, chemistry and material science

Below you will find excerpts from events related to this course:

V

**Physical basics of laser technology**2181612, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)Lecture / Practice (VÜ)  
On-Site

**Content**

Based on the description of the physical basics about the formation and the properties of laser light the lecture goes through the different types of laser beam sources used in industry these days. The lecture focuses on the usage of lasers especially in materials engineering. Other areas like measurement technology or medical applications are also mentioned.

- physical basics of laser technology
- laser beam sources (solid state, diode, gas, liquid and other lasers)
- beam properties, guiding and shaping
- lasers in materials processing
- lasers in measurement technology
- lasers for medical applications
- safety aspects

The lecture is complemented by a tutorial.

The student

- can explain the principles of light generation, the conditions for light amplification as well as the basic structure and function of different laser sources.
- can describe the influence of laser, material and process parameters for the most important methods of laser-based materials processing and choose laser sources suitable for specific applications.
- can illustrate the possible applications of laser sources in measurement and medicine technology
- can explain the requirements for safe handling of laser radiation and for the design of safe laser systems.

Basic knowledge of physics, chemistry and material science is assumed.

regular attendance: 33,5 hours

self-study: 116,5 hours

The assessment consists of an oral exam (ca. 30 min) taking place at the agreed date (according to Section 4(2), 2 of the examination regulation). The re-examination is offered upon agreement.

It is allowed to select only one of the lectures "Laser in automotive engineering" (2182642) or "Physical basics of laser technology" (2181612) during the Bachelor and Master studies.

**Organizational issues**

Termine für die Übung werden in der Vorlesung bekannt gegeben!

**Literature**

F. K. Kneubühl, M. W. Sigrist: Laser, 2008, Vieweg+Teubner

T. Graf: Laser - Grundlagen der Laserstrahlerzeugung 2015, Springer Vieweg

R. Poprawe: Lasertechnik für die Fertigung, 2005, Springer

H. Hügel, T. Graf: Laser in der Fertigung, 2014, Springer Vieweg

J. Eichler, H.-J. Eichler: Laser - Bauformen, Strahlführung, Anwendungen, 2015, Springer

W. T. Silfvast: Laser Fundamentals, 2004, Cambridge University Press

W. M. Steen: Laser Material Processing, 2010, Springer

T


**8.187 Course: Physics for Engineers [T-MACH-100530]**





**Responsible:** Prof. Dr. Martin Dienwiebel  
 Prof. Dr. Peter Gumbsch  
 apl. Prof. Dr. Alexander Nesterov-Müller  
 Dr. Daniel Weygand

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
ST 2024	2142890	<a href="#">Physics for Engineers</a>	4 SWS	Lecture / Practice (/  )	Weygand, Dienwiebel, Nesterov-Müller, Gumbsch
Exams					
ST 2024	76-T-MACH-100530	<a href="#">Physics for Engineers</a>			Gumbsch, Weygand, Nesterov-Müller, Dienwiebel

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**  
 written exam 90 min

**Prerequisites**  
 none

Below you will find excerpts from events related to this course:

V

**Physics for Engineers**

2142890, SS 2024, 4 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)  
 On-Site

**Content**

## 1) Foundations of solid state physics

- Wave particle dualism
- Tunnelling
- Schrödinger equation
- H-atom

## 2) Electrical conductivity of solids

- solid state: periodic potentials
- Pauli Principle
- band structure
- metals, semiconductors and isolators
- p-n junction / diode

## 3) Optics

- quantum mechanical principles of the laser
- linear optics
- non-linear optics

Exercises are used for complementing and deepening the contents of the lecture as well as for answering more extensive questions raised by the students and for testing progress in learning of the topics.

## The student

- has the basic understanding of the physical foundations to explain the relationship between the quantum mechanical principles and the optical as well as electrical properties of materials
- can describe the fundamental experiments, which allow the illustration of these principles

regular attendance: 22,5 hours (lecture) and 22,5 hours (exercises)

self-study: 105 hours

The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

**Organizational issues**

Kontakt: daniel.weygand@kit.edu

**Literature**

- Tipler und Mosca: Physik für Wissenschaftler und Ingenieure, Elsevier, 2004
- Haken und Wolf: Atom- und Quantenphysik. Einführung in die experimentellen und theoretischen Grundlagen, 7. Aufl., Springer, 2000
- Harris, Moderne Physik, Pearson Verlag, 2013

**8.188 Course: Platform Economy [T-WIWI-107506]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101421 - Supply Chain Management](#)  
[M-WIWI-101434 - eBusiness and Service Management](#)  
[M-WIWI-105981 - Information Systems & Digital Business](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each winter term	3

Events					
WT 24/25	2540468	<a href="#">Platform Economy</a>	2 SWS	Lecture /	Weinhardt, Fegert
WT 24/25	2540469	<a href="#">Übung zu Platform Economy</a>	1 SWS	Practice /	Stano
Exams					
ST 2024	7900266	<a href="#">Platform Economy</a>			Weinhardt

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Alternative exam assessment. The assessment is carried out in the form of a one-hour written examination and by carrying out a case study. Details on the assessment will be announced during the lecture.

**Prerequisites**

see below

**Recommendation**

None

Below you will find excerpts from events related to this course:

**Platform Economy**

2540468, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)  
On-Site**

**Content****Lecture and Exercise**

The "Platform Economy" lecture provides a broad range of knowledge related to online platforms and their business models, examining their significance for users, operators, and society as a whole. The course is structured into 8 topical blocks, each exploring a different aspect of the platform economy in depth. Each block is led by a different lecturer who is an expert in the respective topic. The key topics covered in the lecture include:

Network Effects and Two-Sided Markets

- Business Models and Auctions
- Energy Market Engineering
- Digital Involvement: Crowd X & Citizen Science
- Digital Democracy and Social Media
- Analyzing User Behavior
- Trust and Reputation in Digital Platforms
- Ethical Considerations in the Platform Economy

To reinforce the lecture material, each block is accompanied by interactive exercises that encourage a deeper understanding of the topics. In these exercises, students will engage in discussions and explore practical examples that illustrate the theoretical concepts introduced during the lectures. The lecture and exercise also offer a chance to get an idea of the lectures offered during the master's program at our chair.

**Case Study**

In addition to the lectures, you will work on a case study in small groups. Your task will be to develop a business model for an innovative and novel online platform, which will be presented to you by one of our experts, either from the academic team or the industry. This case study offers a chance to gain deeper insights into current trends in the platform economy and to apply the knowledge acquired throughout the course in a practical, hands-on way.

**Literature**

- Bundesministerium für Wirtschaft und Energie (2017). „Kompetenzen für eine digitale Souveränität“ (abrufbar unter <https://www.bmwi.de/Redaktion/DE/Publikationen/Studien/kompetenzen-fuer-eine-digitale-souveraenitaet.html>)
- Bundesministerium für Wirtschaft und Energie (2017). „Weißbuch Digitale Plattformen.“ (abrufbar unter [https://www.bmwi.de/Redaktion/DE/Publikationen/Digitale-Welt/weissbuch-digitale-plattformen.pdf?\\_\\_blob=publicationFile&v=8](https://www.bmwi.de/Redaktion/DE/Publikationen/Digitale-Welt/weissbuch-digitale-plattformen.pdf?__blob=publicationFile&v=8))
- Easley, D., and Kleinberg, J. 2010. “Network Effects,” in *Networks, Crowds, and Markets: Reasoning about a Highly Connected World*, Cambridge University Press, pp. 509–542.
- Eisenmann, T., Parker, G., and Van Alstyne, M. W. 2006. “Strategies for two-sided markets,” *Harvard Business Review* 84(10), pp. 1–11.
- Gassmann, O., Frankenberger, K., and Csik, M. 2013. *Geschäftsmodelle entwickeln: 55 innovative Konzepte mit dem St. Galler Business Model Navigator*, Hanser.
- Wattenhofer, R. 2016. “The science of the blockchain.” CreateSpace Independent Publishing Platform.
- Roth, A. 2002. “The Economist as Engineer: Game Theory, Experimental Economics and Computation as Tools for Design Economics,” *Econometrica* 70(4): 1341-1378, 2002.
- Weinhardt, C., Holtmann, C., Neumann, D., *Market Engineering. Wirtschaftsinformatik*, 2003.
- Wolfstetter, E., 1999. “Topics in Microeconomics - Industrial Organization, Auctions, and Incentives,” Cambridge, Cambridge University Press.
- Teubner, T., and Hawlitschek, F. (in press). “The economics of P2P online sharing,” in *The Sharing Economy: Possibilities, Challenges, and the way forward*, Praeger Publishing.





**T 8.189 Course: PLM-CAD Workshop [T-MACH-102153]**

**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each term	3

Events					
ST 2024	2121357	<a href="#">PLM-CAD Workshop</a>	4 SWS	Project (P / 	Meyer, Mitarbeiter
WT 24/25	2121357	<a href="#">PLM-CAD Workshop</a>	4 SWS	Project (P / 	Mitarbeiter, Rönnau
Exams					
ST 2024	76-T-MACH-102153	<a href="#">PLM-CAD Workshop</a>			Rönnau


Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**  
 Alternative exam assessment (graded)

**Prerequisites**  
 None

**Annotation**  
 Number of participants is limited, compulsory attendance

*Below you will find excerpts from events related to this course:*



**PLM-CAD Workshop**


2121357, SS 2024, 4 SWS, Language: German, [Open in study portal](#)

**Project (PRO)**  
On-Site

**Content**  
 The aim of the workshop is to demonstrate the benefits of collaborative product development using PLM methods and to emphasize their added value compared to classical CAD development.  
 Students learn how to develop and produce a prototype with the help of modern PLM and CAx systems.

**Organizational issues**  
 Siehe Homepage zur Lehrveranstaltung

**Literature**  
 Workshop-Unterlagen / workshop materials



**PLM-CAD Workshop**

2121357, WS 24/25, 4 SWS, Language: German, [Open in study portal](#)

**Project (PRO)**  
On-Site

**Content**  
 The aim of the workshop is to demonstrate the benefits of collaborative product development using PLM methods and to emphasize their added value compared to classical CAD development.  
 Students learn how to develop and produce a prototype with the help of modern PLM and CAx systems.

**Organizational issues**  
 Zeit und Ort siehe ILIAS

**Literature**  
 Workshop-Unterlagen / workshop materials

**8.190 Course: Polymer Engineering I [T-MACH-102137]****Responsible:** Dr.-Ing. Wilfried Liebig**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2173590	<a href="#">Polymer Engineering I</a>	2 SWS	Lecture /	Liebig
Exams					
ST 2024	76-T-MACH-102137	<a href="#">Polymer Engineering I</a>			Liebig
WT 24/25	76-T-MACH-102137	<a href="#">Polymer Engineering I</a>			Liebig

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Oral exam, about 25 minutes

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**Polymer Engineering I**2173590, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)  
On-Site****Content**

1. Economical aspects of polymers
2. Introduction of mechanical, chemical and electrical properties
3. Processing of polymers (introduction)
4. Material science of polymers
5. Synthesis

**learning objectives:**

The field of Polymer Engineering includes synthesis, material science, processing, construction, design, tool engineering, production technology, surface engineering and recycling. The aim is, to equip the students with knowledge and technical skills, and to use the material "polymer" meeting its requirements in an economical and ecological way.

The students

- are able to describe and classify polymers based on the fundamental synthesis processing techniques
- can find practical applications for state-of-the-art polymers and manufacturing technologies
- are able to apply the processing techniques, the application of polymers and polymer composites regarding to the basic principles of material science
- can describe the special mechanical, chemical and electrical properties of polymers and correlate these properties to the chemical bindings.
- can define application areas and the limitation in the use of polymers

**requirements:**

none

**workload:**

regular attendance: 21 hours

self-study: 99 hours



**Literature**

Literaturhinweise, Unterlagen und Teilmanuskript werden in der Vorlesung ausgegeben.

T

**8.191 Course: Polymer Engineering II [T-MACH-102138]****Responsible:** Dr.-Ing. Wilfried Liebig**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)


Type
Oral examination





Credits
4

Grading scale
Grade to a third

Recurrence
Each summer term

Version
1

Events					
ST 2024	2174596	<a href="#">Polymer Engineering II</a>	2 SWS	Lecture / 	Liebig
Exams					
ST 2024	76-T-MACH-102138	<a href="#">Polymerengineering II</a>			Liebig
WT 24/25	76-T-MACH-102138	<a href="#">Polymerengineering II</a>			Liebig

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Oral exam, about 25 minutes

**Prerequisites**

none

**Recommendation**

Knowledge in Polymerengineering I

Below you will find excerpts from events related to this course:

V

**Polymer Engineering II**2174596, SS 2024, 2 SWS, Language: German, [Open in study portal](#)Lecture (V)  
On-Site

**Content**

1. Processing of polymers
  2. Properties of polymer components
- Based on practical examples and components
- 2.1 Selection of material
  - 2.2 Component design
  - 2.3 Tool engineering
  - 2.4 Production technology
  - 2.5 Surface engineering
  - 2.6 Sustainability, recycling

**learning objectives:**

The field of Polymer Engineering includes synthesis, material science, processing, construction, design, tool engineering, production technology, surface engineering and recycling. The aim is, that the students gather knowledge and technical skills to use the material "polymer" meeting its requirements in an economical and ecological way.

The students

- can describe and classify different processing techniques and can exemplify mould design principles based on technical parts.
- know about practical applications and processing of polymer parts
- are able to design polymer parts according to given restrictions
- can choose appropriate polymers based on the technical requirements
- can decide how to use polymers regarding the production, economical and ecological requirements

**requirements:**

Polymerengineering I

**workload:**

The workload for the lecture Polymerengineering II is 120 h per semester and consists of the presence during the lecture (21 h) as well as preparation and rework time at home (99 h).

**Literature**

Literaturhinweise, Unterlagen und Teilmanuskript werden in der Vorlesung ausgegeben.

Recommended literature and selected official lecture notes are provided in the lecture.

T


## 8.192 Course: Power Generation [T-ETIT-101924]





**Responsible:** Dr.-Ing. Bernd Hoferer

**Organisation:** KIT Department of Electrical Engineering and Information Technology

**Part of:** [M-ETIT-106821 - Electric Energy Systems and Power Generation](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each winter term	2

Events					
WT 24/25	2307356	<a href="#">Power Generation</a>	2 SWS	Lecture / 	Hoferer
Exams					
ST 2024	7307356	<a href="#">Power Generation</a>			Hoferer
WT 24/25	7307356	<a href="#">Power Generation</a>			Hoferer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

#### Prerequisites

none

T

**8.193 Course: Practical course in robot programming with Python [T-MACH-113670]**

**Responsible:** Prof. Dr.-Ing. Arne Rönnau  
**Organisation:** KIT Department of Mechanical Engineering  
**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)


**Type**  
Completed coursework





**Credits**  
4

**Grading scale**  
pass/fail

**Expansion**  
1 terms

**Version**  
1

Events					
WT 24/25	2121340	<a href="#">Practical course in robot programming with Python</a>	3 SWS	Practical course / 	Rönnau

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The academic achievement is carried out using walking robots. The overall impression made during the internship is assessed:

- Participation and engagement in workshops on robot programming basics
- Group work in teams of 4 people
- Demonstration of the results in the final robot competition between the teams

**Prerequisites**

none

**Annotation**

Limited number of participants.

Below you will find excerpts from events related to this course:

V

**Practical course in robot programming with Python**

2121340, WS 24/25, 3 SWS, Language: English, [Open in study portal](#)

**Practical course (P)**  
**On-Site**

**Content**

The practical course teaches the basics of programming mobile robots. The most important syntax elements of Python are first repeated and the framework requirements and the relevant development tools are introduced. The modern four-legged walking robot Go2 from the company Unitree is used in the practical course. This robot has numerous sensors and motors that need to be read out and controlled in order to solve complex tasks. The open source framework ROS2, which is used intensively in robotics research, serves as the basis for the practical course. However, the focus of the course is on programming basic, key robotic functions using Python and not on the complex ROS2 framework.

**Qualification goals**

Students will be able to programme new software components and functions for mobile robots using Python. Therefore, students know the basic elements of a mobile robot and its programming and development environment. They will be able to add their own software elements in the right sections of an existing development project or adapt existing ones and execute their code on the robot. The different requirements and framework conditions for programming software for perception, task and motion planning and control or interaction are known and can be taken into account when developing Python software.

**Organizational issues**

Kick-off (Auftakt) Tue 22 Oct 15:45 Bldg. 20.20 MaiRo-Lab ground floor

T

**8.194 Course: Practical Seminar: Digital Services [T-WIWI-110888]****Responsible:** Prof. Dr. Gerhard Satzger**Organisation:** KIT Department of Economics and Management**Part of:** [M-WIWI-102752 - Fundamentals of Digital Service Systems](#)  
[M-WIWI-105981 - Information Systems & Digital Business](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each summer term	1

Exams				
ST 2024	7900375	<a href="#">Practical Seminar: Digital Services</a>	Satzger	

**Competence Certificate**

The assessment consists of a seminar paper, a presentation of the results and the contribution to the discussion. In the seminar, a maximum score of 60 points can be achieved, consisting of

- maximum 25 points for the documentation (written examination)
- maximum 25 points for the practical assessment
- maximum 10 points for the participation during the discussion sessions

The practical seminar is passed when at least a score of 30 points is achieved.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

The current range of seminar topics is announced on the following Website:



[www.dsi.iism.kit.edu](http://www.dsi.iism.kit.edu).





## T

## 8.195 Course: Practical Seminar: Interactive Systems [T-WIWI-111914]

**Responsible:** Prof. Dr. Alexander Mädche  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105928 - HR Management & Digital Workplace](#)  
[M-WIWI-105981 - Information Systems & Digital Business](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	1

Events					
ST 2024	2540555	<a href="#">Practical Seminar: Interactive Systems</a>	3 SWS	Lecture / 	Mädche
WT 24/25	2540555	<a href="#">Practical Seminar: Interactive Systems</a>	3 SWS	Lecture / 	Mädche
Exams					
ST 2024	7900113	<a href="#">Practical Seminar: Interactive Systems</a>			Mädche

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Alternative exam assessment.

The assessment of this course consists of the implementation of a practical component, the preparation of a written documentation, and active participation in the discussions.

A total of 60 points can be achieved, of which:

- maximum 25 points for the written documentation
- maximum 25 points for the practical component
- maximum 10 points for active participation in the discussions

A minimum of 30 points must be achieved to pass this course.

Please note that a practical component, such as conducting a survey or implementing an application, is also part of the course. Please refer to the institute website [issd.iism.kit.edu](https://issd.iism.kit.edu) for the current offer of practical seminar theses.

Below you will find excerpts from events related to this course:

## V

### Practical Seminar: Interactive Systems

2540555, SS 2024, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
Blended (On-Site/Online)

### Content

In this practical seminar, students get an individual assignment and develop a running software prototype. Beside the software prototype, the students also deliver a written documentation.

Please find the current open offerings on our website: <https://h-lab.iism.kit.edu/thesis.php>

T

**8.196 Course: Practical Seminar: Platform Economy [T-WIWI-112154]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105981 - Information Systems & Digital Business](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	1

**Competence Certificate**

The assessment of this course is in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class. Please take into account that, beside the written documentation, also a practical component (e.g. implementation of a prototype) is part of the course. Please examine the course description for the particular tasks. The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class).

**Prerequisites**

None.

**Annotation**

Teaching and learning format: Seminar



**8.197 Course: Practical Training in Basics of Microsystem Technology [T-MACH-102164]****Responsible:** Dr. Arndt Last**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
ST 2024	2143875	<a href="#">Introduction to Microsystem Technology - Practical Course</a>	2 SWS	Practical course /	Last
WT 24/25	2143875	<a href="#">Introduction to Microsystem Technology - Practical Course</a>	2 SWS	Practical course /	Last
WT 24/25	2143877	<a href="#">Introduction to Microsystem Technology - Practical Course</a>	2 SWS	Practical course /	Last
Exams					
ST 2024	76-T-MACH-102164	<a href="#">Practical Training in Basics of Microsystem Technology</a>			Last
WT 24/25	76-T-MACH-102164	<a href="#">Practical Training in Basics of Microsystem Technology</a>			Last

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**Introduction to Microsystem Technology - Practical Course**2143875, SS 2024, 2 SWS, Language: German, [Open in study portal](#)**Practical course (P)  
On-Site****Content**

In the practical training includes ten experiments:

1. Röntgenoptik
2. UVL + REM
3. Mischerbauteil
4. Rasterkraftmikroskopie
5. 3D-Printing
6. Lichtstreuung an Chrommasken
7. Abformung
8. SAW-Biosensorik
9. Nano3D-Drucker - Materialtransfer dünnster Schichten
10. Elektrospinning

Each student takes part in only four experiments.

The experiments are carried out at real workstations at the IMT and coached by IMT-staff.

**Organizational issues**

Das Praktikum findet in den Laboren des IMT am CN statt. Treffpunkt: Bau 301, vor dem Eingang.

Teilnahmeanfragen an [arndt.last@kit.edu](mailto:arndt.last@kit.edu)

**Literature**

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997  
Unterlagen zum Praktikum zur Vorlesung ' Grundlagen der Mikrosystemtechnik'

**Introduction to Microsystem Technology - Practical Course**

2143875, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Practical course (P)  
On-Site**

**Literature**

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997  
Unterlagen zum Praktikum zur Vorlesung ' Grundlagen der Mikrosystemtechnik'

**Introduction to Microsystem Technology - Practical Course**

2143877, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Practical course (P)  
On-Site**

**Literature**

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997  
Unterlagen zum Praktikum zur Vorlesung ' Grundlagen der Mikrosystemtechnik'

T

**8.198 Course: Problem Solving, Communication and Leadership [T-WIWI-102871]**

**Responsible:** Prof. Dr. Hagen Lindstädt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101425 - Strategy and Organization](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	2	Grade to a third	Each summer term	2

Exams			
ST 2024	7900068	<a href="#">Problem Solving, Communication and Leadership</a>	Lindstädt
WT 24/25	7900070	<a href="#">Problem Solving, Communication and Leadership</a>	Lindstädt

**Competence Certificate**

The assessment consists of a written exam (30 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

T

**8.199 Course: Procedures of Remote Sensing [T-BGU-103542]****Responsible:** Dr.-Ing. Uwe Weidner**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Grading scale	Version
Oral examination	3	Grade to a third	2


Exams			
ST 2024	8280103542	<a href="#">Procedures of Remote Sensing</a>	Weidner





T

## 8.200 Course: Procedures of Remote Sensing, Prerequisite [T-BGU-101638]

**Responsible:** Dr.-Ing. Uwe Weidner**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1	pass/fail	Each summer term	1

Events					
ST 2024	6020244	<a href="#">Procedures of Remote Sensing, Exercise</a>	1 SWS	Practice / 	Weidner
Exams					
ST 2024	8284101638	<a href="#">Procedures of Remote Sensing, Prerequisite</a>			Weidner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

T


## 8.201 Course: Process Fundamentals by the Example of Food Production [T-CIWVT-106058]





**Responsible:** PD Dr. Volker Gaukel

**Organisation:** KIT Department of Chemical and Process Engineering

**Part of:** [M-WIWI-101839 - Additional Fundamentals of Engineering](#)

Type	Credits	Grading scale	Version
Written examination	3	Grade to a third	1

Events					
WT 24/25	2211110	<a href="#">Process Fundamentals by the Example of Food Production</a>	2 SWS	Lecture / 	Gaukel
Exams					
ST 2024	7220007	<a href="#">Process fundamentals by the example of food production</a>			Gaukel

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Prerequisites

none

T


**8.202 Course: Product- and Production-Concepts for Modern Automobiles [T-MACH-110318]**





**Responsible:** Dr. Stefan Kienzle  
Dr. Dieter Steegmüller

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2149670	<a href="#">Product- and Production-Concepts for modern Automobiles</a>	2 SWS	Lecture / 	Steegmüller, Kienzle
Exams					
WT 24/25	76-T-MACH-110318	<a href="#">Product- and Production-Concepts for modern Automobiles</a>			Steegmüller, Kienzle

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Oral Exam (20 min)

**Prerequisites**

T-MACH-105166 - Materials and Processes for Body Lightweight Construction in the Automotive Industry must not have been started.

Below you will find excerpts from events related to this course:

V

**Product- and Production-Concepts for modern Automobiles**

2149670, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
Blended (On-Site/Online)

**Content**

The lecture illuminates the practical challenges of modern automotive engineering. As former leaders of the automotive industry, the lecturers refer to current aspects of automotive product development and production.

The aim is to provide students with an overview of technological trends in the automotive industry. In this context, the course also focuses on changes in requirements due to new vehicle concepts, which may be caused by increased demands for individualisation, digitisation and sustainability. The challenges that arise in this context will be examined from both a production technology and product development perspective and will be illustrated with practical examples thanks to the many years of industrial experience of both lecturers.

The topics covered are:

- General conditions for vehicle and body development
- Integration of new drive technologies
- Functional requirements (crash safety etc.), also for electric vehicles
- Development Process at the Interface Product & Production, CAE/Simulation
- Energy storage and supply infrastructure
- Aluminium and lightweight steel construction
- FRP and hybrid parts
- Battery, fuel cell and electric motor production
- Joining technology in modern car bodies
- Modern factories and production processes, Industry 4.0.

**Learning Outcomes:**

The students ...

- are able to name the presented general conditions of vehicle development and are able to discuss their influences on the final product using practical examples.
- are able to name the various lightweight approaches and identify possible areas of application.
- are able to identify the different production processes for manufacturing lightweight structures and explain their functions.
- are able to perform a process selection based on the methods and their characteristics.

**Workload:**

regular attendance: 25 hours

self-study: 95 hours

**Organizational issues**

Termine werden über Ilias bekannt gegeben.

Bei der Vorlesung handelt es sich um eine Blockveranstaltung. Eine Anmeldung über Ilias ist erforderlich.

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (<https://www.karlsruher-forschungsfabrik.de>) unterstützt.

The lecture is a block course. An application in Ilias is mandatory.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (<https://www.karlsruher-forschungsfabrik.de/en.html>) to deepen the acquired knowledge.

**Literature****Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).



T


## 8.203 Course: Product Lifecycle Management [T-MACH-105147]





**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each winter term	2

Events					
WT 24/25	2121350	<a href="#">Product Lifecycle Management</a>	2 SWS	Lecture / 	Ovtcharova, Elstermann
Exams					
ST 2024	76-T-MACH-105147	<a href="#">Product Lifecycle Management</a>			Ovtcharova, Elstermann
WT 24/25	76-T-MACH-105147	<a href="#">Product Lifecycle Management</a>			Ovtcharova, Elstermann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Written examination 90 min.

### Prerequisites

None

Below you will find excerpts from events related to this course:

V

### Product Lifecycle Management

2121350, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

The course includes:

- Basics for product data management and data exchange
- IT system solutions for Product Lifecycle Management (PLM)
- Economic viability analysis and implementation problems
- Illustrative scenario for PLM using the example of the institute's own I4.0Lab

After successful attendance of the course, students can:

- identify the challenges of data management and exchange and describe solution concepts for these challenges.
- clarify the management concept PLM and its goals and highlight the economic benefits.
- explain the processes required to support the product life cycle and describe the most important business software systems (PDM, ERP, ...) and their functions.

**Literature**

Vorlesungsfolien.

- V. Arnold et al: Product Lifecycle Management beherrschen, Springer-Verlag, Heidelberg, 2005.
- J. Stark: Product Lifecycle Management, 21st Century Paradigm for Product Realisation, Springer-Verlag, London, 2006.
- A. W. Scheer et al: Prozessorientiertes Product Lifecycle Management, Springer-Verlag, Berlin, 2006.
- J. Schöttner: Produktdatenmanagement in der Fertigungsindustrie, Hanser-Verlag, München, 1999.
- M.Eigner, R. Stelzer: Produktdaten Management-Systeme, Springer-Verlag, Berlin, 2001.
- G. Hartmann: Product Lifecycle Management with SAP, Galileo press, 2007.
- K. Obermann: CAD/CAM/PLM-Handbuch, 2004.

T

## 8.204 Course: Product, Process and Resource Integration in the Automotive Industry [T-MACH-102155]

**Responsible:** Prof. Dr.-Ing. Sama Mbang

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	2

Events					
ST 2024	2123364	<a href="#">Product, Process and Resource Integration in the Automotive Industry</a>	2 SWS	Lecture / Practice (/)	Mbang

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

Oral examination 20 min.

### Prerequisites

None

### Annotation

Limited number of participants.

Below you will find excerpts from events related to this course:

V

## Product, Process and Resource Integration in the Automotive Industry

2123364, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)  
On-Site

### Content

- Overview of product development in the automotive sector (process- and work cycle, IT-Systems)
- Integrated product models in the automotive industry (product, process and resource)
- New CAx modeling methods (intelligent feature technology, templates & functional modeling)
- Automation and knowledge-based mechanism for product design and production planning
- Product development in accordance with defined process and requirement (3D-master principle, tolerance models)
- Concurrent Engineering, shared working
- Enhanced concepts: the digital and virtual factory (application of virtual technologies and methods in the product development)

### Organizational issues

Blockveranstaltung

### Literature

Vorlesungsfolien

**T 8.205 Course: Production Economics and Sustainability [T-WIWI-102820]**

**Responsible:** Prof. Dr. Frank Schultmann  
 Dr.-Ing. Rebekka Volk  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101437 - Industrial Production I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2581960	<a href="#">Production Economics and Sustainability</a>	2 SWS	Lecture /	Volk, Schultmann, Bischof
Exams					
ST 2024	7981960	<a href="#">Production Economics and Sustainability</a>			Schultmann

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of an oral (30 minutes) or written exam (60 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

Below you will find excerpts from events related to this course:

**V Production Economics and Sustainability** **Lecture (V)**  
**On-Site**  
 2581960, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Content**

The analysis and management of material flows on the company level and above will be the focus of this lecture. Herein, the discussion will be about cost-effective and environmentally acceptable steps to avoid, abate and recycle emissions and waste as well as ways of efficient resources handling. As methods material flow analysis (MFA), life cycle assessment (LCA) and OR methods, e.g. for decision support, are introduced.

Topics:

- regulations related to materials and substances
- raw materials, reserves and their availabilities/lifetimes
- material and substance flow analysis (MFA/SFA)
- material related ecoprofiles, e.g. Carbon Footprint
- LCA
- resource efficiency
- emission abatement
- waste management and closed-loop recycling
- raw material oriented production systems
- environmental management (EMAS, ISO 14001, Ecoprofit), eco-controlling

**Organizational issues**

Seminarraum Uni-West, Geb. 06.33

**Literature**

wird in der Veranstaltung bekannt gegeben

**8.206 Course: Production Technology for E-Mobility [T-MACH-110984]**

**Responsible:** Prof. Dr.-Ing. Jürgen Fleischer  
**Organisation:** KIT Department of Mechanical Engineering  
**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each summer term	2

Events					
ST 2024	2150605	<a href="#">Production Technology for E-Mobility</a>	2 SWS	Lecture /	Fleischer
Exams					
ST 2024	76-T-MACH-110984	<a href="#">Production Technology for E-Mobility</a>			Fleischer
WT 24/25	76-T-MACH-110984	<a href="#">Production Technology for E-Mobility</a>			Fleischer

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Written Exam (60 min)

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**Production Technology for E-Mobility**

2150605, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

In the lecture Production Engineering for Electromobility the students should be enabled to design, select and develop production processes for the production of the components of an electric drive train (electric motor, battery cells, fuel cells) by using research-oriented teaching.

**Learning Outcomes:**

The students are able to:

- describe the structure and function of a fuel cell, an electric traction drive and a battery system.
- reproduce the process chains for the production of the components fuel cell, battery and electric traction drive.
- apply methodical tools to solve problems along the process chain.
- derive the challenges in the production of electric drives for electric mobility.
- describe the factors influencing the individual process steps on each other using the process chain of Li-ion battery cells.
- enumerate or describe the necessary process parameters to counteract the influencing factors of the process steps in Li-ion battery cell production.
- apply methodical tools to solve problems along the process chain for the production of Li-ion battery cells.
- derive the challenge of mounting and dismounting battery modules.
- derive the challenges in the production of fuel cells for use in mobility.

**Workload:**

regular attendance: 42 hours

self-study: 78 hours

**Organizational issues**

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (<https://www.karlsruher-forschungsfabrik.de>) unterstützt.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (<https://www.karlsruher-forschungsfabrik.de/en.html>) to deepen the acquired knowledge.

**Literature**

Skript zur Veranstaltung wird über Ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>)

T


## 8.207 Course: Production, Logistics and Information Systems [T-WIWI-111602]





**Responsible:** Prof. Dr. Wolf Fichtner  
 Prof. Dr. Andreas Geyer-Schulz  
 Prof. Dr. Alexander Mädche  
 Prof. Dr. Stefan Nickel  
 Prof. Dr. Frank Schultmann  
 Prof. Dr. Christof Weinhardt

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-105770 - Production, Logistics and Information Systems](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	2

Events					
WT 24/25	2600004		2 SWS	Lecture	Mädche
WT 24/25	2600005	<a href="#">Produktion und Logistik</a>	2 SWS	Lecture / 	Fichtner, Nickel, Schultmann
WT 24/25	2610029		2 SWS	Tutorial (	Nickel
Exams					
ST 2024	7900077	<a href="#">Production, Logistics and Information Systems</a>			Schultmann, Nickel, Fichtner, Weinhardt, Mädche, Geyer-Schulz
WT 24/25	7900154	<a href="#">Production, Logistics and Information Systems</a>			Schultmann, Nickel, Weinhardt, Mädche, Geyer-Schulz, Fichtner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Written Exam. The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

Below you will find excerpts from events related to this course:

V

2600004, WS 24/25, 2 SWS, [Open in study portal](#)

Lecture (V)

T


## 8.208 Course: Project in Applied Remote Sensing [T-BGU-101814]

**Responsible:** Prof. Dr.-Ing. Stefan Hinz  
Dr.-Ing. Uwe Weidner

**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences

**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Grading scale	Version
Completed coursework	1	pass/fail	1

Events					
ST 2024	6020245	<a href="#">Projektübung angewandte Fernerkundung</a>	2 SWS	Practice / 	Hinz, Weidner, Wursthorn
Exams					
ST 2024	8284101814	<a href="#">Project in Applied Remote Sensing</a>			Weidner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled



**T** **8.209 Course: Project Internship Additive Manufacturing: Development and Production of an Additive Component [T-MACH-110960]**

**Responsible:** Prof. Dr.-Ing. Frederik Zanger  
**Organisation:** KIT Department of Mechanical Engineering  
**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each winter term	2

Events					
WT 24/25	2149700	<a href="#">Project Internship Additive Manufacturing: Development and Production of an Additive Component</a>	2 SWS	Practical course /	Zanger, Frey
Exams					
WT 24/25	76-T-MACH-110960	<a href="#">Project Internship Additive Manufacturing: Development and Production of an Additive Component</a>			Zanger

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Alternative test achievement (graded)

The competence certificate is a project work; alternative test achievement according to § 4 Abs. 2 No. 3 of the SPO. Here, the project work, the milestone-based presentation of the results in presentation form (10 min each) and a final oral examination (15 min) are included in the assessment.

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**V** **Project Internship Additive Manufacturing: Development and Production of an Additive Component** Practical course (P)  
On-Site  
 2149700, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Content**

The lecture "Project Internship Additive Manufacturing: Development and Production of an Additive Component" combines the basics of metallic laser powder bed fusion (LPBF) with a development project in cooperation with an industrial company. The students learn the basics of the following topics in the project-related lecture:

- Influence of different process variables on the component quality of parts produced in the LPBF process
- Preparation and simulation of the LPBF process
- Production of additive metallic components
- Process monitoring and quality assurance in additive manufacturing
- Topology optimization
- CAM for subtractive rework

The topics addressed in the course will be applied practically in various workshops on the individual topics and transferred to the developmental task in self-study.

Finally, the results of the elaborations are produced additively and post-processed subtractively.

**Learning Outcomes:**

The students ...

- are able to describe the properties and applications of the additive manufacturing processes laser powder bed fusion (LPBF).
- are able to select the appropriate manufacturing process for a technical application.
- are able to describe and implement the creation of a product along the entire additive process chain (CAD, simulation, work preparation, CAM) from the idea to the production.
- are able to discuss the development process for components that are optimized for additive manufacturing.
- are able to perform topology optimization.
- are able to simulate the additive process, compensate for process-related distortions and determine the ideal alignment on the building platform.
- are able to create necessary support structures for the additive process and to derive a building order file.
- are able to create a CAM model for the subtractive rework process of additive parts.

**Workload:**

regular attendance: 12 hours

self-study: 108 hours

**Organizational issues**

Die Veranstaltung beginnt mit einer Blockveranstaltung vor Semesterbeginn. Während des Semesters finden nur einzelne Pflichtveranstaltungen statt. Die genauen Termine werden über die Vorlesungsankündigung des wbk mitgeteilt: <http://www.wbk.kit.edu/studium-und-lehre.php>

Aus organisatorischen Gründen ist die Teilnehmerzahl für die Lehrveranstaltung begrenzt. Infolgedessen wird ein Auswahlprozess stattfinden. Der Link zur Bewerbung wird in der Vorlesungsankündigung über die Homepage des wbk (<http://www.wbk.kit.edu/studium-und-lehre.php>) zur Verfügung gestellt.


**Literature**





Skript zur Veranstaltung wird über Ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

**8.210 Course: Project Management [T-BGU-101675]**

**Responsible:** Prof. Dr.-Ing. Shervin Haghsheno  
**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences  
**Part of:** [M-BGU-101004 - Fundamentals of Construction](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each winter term	2

Events					
WT 24/25	6200106	<a href="#">Project Management</a>	2 SWS	Lecture / Practice (/  )	Haghsheno, Schneider, John

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

written exam with 60 minutes

**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

Below you will find excerpts from events related to this course:

**Project Management**

6200106, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)  
On-Site

**Content**

This course provides a comprehensive introduction to (construction) project management. It takes a closer look at the organisation and delivery of a construction project from the client's perspective. In this context, a range of competences are presented that should be on hand for the successful execution of project management. In addition, we present a selection of project management methods for individual competences and illustrate them with case studies.

**Organizational issues**

Vorlesungen: Mittwochs vom 23.10.2024 bis 12.02.2025, jeweils 09:45 – 11:15 Uhr (hybrid)

Übungen: Asynchron ab 13.11.2024, 04.12.2024, 08.01.2025, 05.02.2025 (online)

**Literature**

- AHRENS, Hannsjörg; BASTIAN, Klemens; MUCHOWSKI, Lucian (Hrsg.) (2021) *Handbuch Projektsteuerung - Baumanagement: Ein praxisorientierter Leitfaden mit zahlreichen Hilfsmitteln und Arbeitsunterlagen*, 6. Auflage, Fraunhofer IRB Verlag, Stuttgart
- GPM Deutsche Gesellschaft für Projektmanagement e. V. (Hrsg.) (2017) *Individual Competence Baseline für Projektmanagement (Version 4.0)*, 1. Auflage, GPM Deutsche Gesellschaft für Projektmanagement e. V., Nürnberg
- HAGHSHENO, Shervin; JOHN, Paul Christian (2024) *Bauherrnseitige Projektmanagement-Dienstleistungen in Deutschland*, Forschungsbericht, DVP – Deutscher Verband für Projektmanagement in der Bau- und Immobilienwirtschaft e. V.
- KOCHENDÖRFER, Bernd; LIEBCHEN, Jens H.; VIERING, Markus G. (2021) *Bau-Projekt-Management: Grundlagen und Vorgehensweisen*, 6. Auflage, Springer Vieweg, Wiesbaden
- SCHULZ, Markus (2020) *Projektmanagement: Zielgerichtet. Effizient. Klar.*, 2. Auflage, UVK Verlag, Tübingen

**8.211 Course: Project Workshop: Automotive Engineering [T-MACH-102156]**

**Responsible:** Dr.-Ing. Michael Frey  
Prof. Dr. Frank Gauterin  
Dr.-Ing. Martin Gießler

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101264 - Handling Characteristics of Motor Vehicles](#)  
[M-MACH-101265 - Vehicle Development](#)  
[M-MACH-101266 - Automotive Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4,5	Grade to a third	Each term	1

Events					
ST 2024	2115817	<a href="#">Project Workshop: Automotive Engineering</a>	3 SWS	Lecture /	Gauterin, Gießler, Frey
WT 24/25	2115817	<a href="#">Project Workshop: Automotive Engineering</a>	3 SWS	Lecture /	Gießler, Frey
Exams					
ST 2024	76-T-MACH-102156	<a href="#">Project Workshop: Automotive Engineering</a>			Gauterin

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Oral examination

Duration: 30 up to 40 minutes

Auxiliary means: none

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**Project Workshop: Automotive Engineering**

2115817, SS 2024, 3 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**  
**On-Site**

**Content**

During the Project Workshop Automotive Engineering a team of six persons will work on a task given by an German industrial partner using the instruments of project management. The task is relevant for the actual business and the results are intended to be industrialized after the completion of the project workshop.

The team will generate approaches in its own responsibility and will develop solutions for practical application. Coaching will be supplied by both, company and institute.

At the beginning in a start-up meeting goals and structure of the project will be specified. During the project workshop there will be weekly team meetings. Also a milestone meeting will be held together with persons from the industrial company. In a final presentation the project results will be presented to the company management and to institute representatives.

Learning Objectives:

The students are familiar with typical industrial development processes and working style. They are able to apply knowledge gained at the university to a practical task. They are able to analyze and to judge complex relations. They are ready to work self-dependently, to apply different development methods and to work on approaches to solve a problem, to develop practice-oriented products or processes.

**Organizational issues**

Begrenzte Teilnehmerzahl mit Auswahlverfahren, die Bewerbungen sind am Ende des vorhergehenden Semesters einzureichen.

Raum und Termine: s. Aushang bzw. Homepage

**Literature**

Steinle, Claus; Bruch, Heike; Lawa, Dieter (Hrsg.), Projektmanagement, Instrument moderner Innovation, FAZ Verlag, Frankfurt a. M., 2001, ISBN 978-3929368277

Skripte werden beim Start-up Meeting ausgegeben.

**Project Workshop: Automotive Engineering**

2115817, WS 24/25, 3 SWS, Language: German, [Open in study portal](#)

**Lecture (V)  
On-Site**

**Content**

During the Project Workshop Automotive Engineering a team of six persons will work on a task given by an German industrial partner using the instruments of project management. The task is relevant for the actual business and the results are intended to be industrialized after the completion of the project workshop.

The team will generate approaches in its own responsibility and will develop solutions for practical application. Coaching will be supplied by both, company and institute.

At the beginning in a start-up meeting goals and structure of the project will be specified. During the project workshop there will be weekly team meetings. Also a milestone meeting will be held together with persons from the industrial company. In a final presentation the project results will be presented to the company management and to institute representatives.

Learning Objectives:

During the Project Workshop Automotive Engineering a team of six persons will work on a task given by an German industrial partner using the instruments of project management. The task is relevant for the actual business and the results are intended to be industrialized after the completion of the project workshop.

The team will generate approaches in its own responsibility and will develop solutions for practical application. Coaching will be supplied by both, company and institute.

At the beginning in a start-up meeting goals and structure of the project will be specified. During the project workshop there will be weekly team meetings. Also a milestone meeting will be held together with persons from the industrial company. In a final presentation the project results will be presented to the company management and to institute representatives.

**Organizational issues**

Begrenzte Teilnehmerzahl mit Auswahlverfahren, in deutscher Sprache. Bewerbungen sind am Ende des vorhergehenden Semesters einzureichen.

Termin und Raum: siehe Institutshomepage.

Limited number of participants with selection procedure, in German language. Please send the application at the end of the previous semester

Date and room: see homepage of institute.

**Literature**

Steinle, Claus; Bruch, Heike; Lawa, Dieter (Hrsg.), Projektmanagement, Instrument moderner Innovation, FAZ Verlag, Frankfurt a. M., 2001, ISBN 978-3929368277

Skripte werden beim Start-up Meeting ausgegeben.



The scripts will be supplied in the start-up meeting.





T

## 8.212 Course: Public Law I &amp; II [T-INFO-110300]

**Responsible:** N.N.  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-105084 - Public and Civil Law](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
ST 2024	24520	<a href="#">Öffentliches Recht II - Öffentliches Wirtschaftsrecht</a>	2 SWS	Lecture / 	Zufall
WT 24/25	24016	<a href="#">Öffentliches Recht I - Grundlagen</a>	2 SWS	Lecture / 	Zufall
Exams					
ST 2024	7500298	<a href="#">Public Law I &amp; II</a>			Zufall
WT 24/25	7500138	<a href="#">Public Law I &amp; II</a>			Zufall

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**8.213 Course: Public Revenues [T-WIWI-102739]**

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101403 - Public Finance](#)  
[M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-101668 - Economic Policy I](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2024	2560120	<a href="#">Public Revenues</a>	2 SWS	Lecture /	Wigger
ST 2024	2560121	<a href="#">Übung zu Öffentliche Einnahmen</a>	1 SWS	Practice /	Wigger, Schmelzer
Exams					
ST 2024	790oeff	<a href="#">Public Revenues</a>			Wigger
WT 24/25	790oeff	<a href="#">Public Revenues</a>			Wigger

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Depending on the further pandemic development the assessment will consist either of an open book exam (following Art. 4, para. 2, clause 3 of the examination regulation), or of an 1h written exam (following Art. 4, para. 2, clause 1 of the examination regulation).

**Prerequisites**

None

**Recommendation**

Basic knowledge of Public Finance is required.

Below you will find excerpts from events related to this course:

**Public Revenues**

2560120, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

The *Public Revenues* lecture is concerned with the theory and policy of taxation and public dept. In the first chapter, fundamental concepts of taxation theory are introduced, whereas the second chapter deals with key elements of the German taxation system. The allocative and distributive effects of different taxation types are examined in chapter three and four. Chapter five integrates both allocative and distributive components in order to derive a theory of optimal taxation. The core of the sixth chapter is represented by international aspects of taxation. The debt part begins with a description of the extent and structure of public dept in chapter seven. In the following chapter, macroeconomic theories of national dept are evolved, while chapter nine is concerned with its long term consequences when employed as a regular instrument of budgeting. Finally, the tenth chapter deals with constitutional limits to public debt-incurring.

**Learning goals:**

See German version.

**Workload:**

The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature****Literatur:**

- Homburg, S.(2000): *Allgemeine Steuerlehre*, Vahlen
- Rosen, H.S.(1995): *Public Finance*; 4. Aufl., Irwin
- Wellisch, D.(2000): *Finanzwissenschaft I und Finanzwissenschaft III*, Vahlen
- Wigger, B. U.(2006): *Grundzüge der Finanzwissenschaft*; 2. Aufl., Springer

**8.214 Course: Python Algorithm for Vehicle Technology [T-MACH-110796]****Responsible:** Stephan Rhode**Organisation:****Part of:** [M-MACH-101265 - Vehicle Development](#)  
[M-MACH-101266 - Automotive Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each summer term	1

Events					
ST 2024	2114862	<a href="#">Python Algorithms for Automotive Engineering</a>	2 SWS	Lecture / <b>X</b>	Rhode

Legend: Online, Blended (On-Site/Online), On-Site, **X** Cancelled**Competence Certificate**

Written Examination

Duration: 90 minutes

**Prerequisites**

none

Below you will find excerpts from events related to this course:

**Python Algorithms for Automotive Engineering**2114862, SS 2024, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**  
**Cancelled****Content**Teaching content:

- Introduction to Python and useful tools and libraries for creating algorithms, graphical representation, optimization, symbolic arithmetic and machine learning
  - [Anaconda](#), [Pycharm](#), [Jupyter](#)
  - [NumPy](#), [Matplotlib](#), [SymPy](#), [Scikit-Learn](#)
- Methods and tools for creating software
  - Version management [GitHub](#), [git](#)
  - Testing software [pytest](#), [Pylint](#)
  - Documentation [Sphinx](#)
  - Continuous Integration (CI) [Travis CI](#)
  - Workflows in Open Source and Inner Source, Kanban, Scrum
- Practical programming projects to:
  - Road sign recognition
  - Vehicle state estimation
  - Calibration of vehicle models by mathematical optimization
  - Data-based modelling of the powertrain of an electric vehicle

Objectives:

The students have an overview of the programming language Python and important Python libraries to solve automotive engineering problems with computer programs. The students know current tools around Python to create algorithms, to apply them and to interpret and visualize their results. Furthermore, the students know basics in the creation of software to be used in later programming projects in order to develop high-quality software solutions in teamwork. Through practical programming projects (road sign recognition, vehicle state estimation, calibration, data-based modelling), the students can perform future complex tasks from the area of driver assistance systems.

**Organizational issues**

Die Vorlesung wird im erst wieder im Sommersemester 2025 stattfinden.




**Literature**





- A Whirlwind Tour of Python, Jake VanderPlas, Publisher: O'Reilly Media, Inc. Release Date: August 2016, ISBN: 9781492037859 [link](#)
- Scientific Computing with Python 3, Olivier Verdier, Jan Erik Solem, Claus Führer, Publisher: Packt Publishing, Release Date: December 2016, ISBN: 9781786463517 [link](#)
- Introduction to Machine Learning with Python, Sarah Guido, Andreas C. Müller, Publisher: O'Reilly Media, Inc., Release Date: October 2016, ISBN: 9781449369880, [link](#)
- Clean Code, Robert C. Martin, Publisher: Prentice Hall, Release Date: August 2008, ISBN: 9780136083238, [link](#)

T

**8.215 Course: Quality Management [T-MACH-102107]****Responsible:** Prof. Dr.-Ing. Gisela Lanza**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each winter term	3

Events					
WT 24/25	2149667	<a href="#">Quality Management</a>	2 SWS	Lecture / 	Lanza, Stamer
Exams					
ST 2024	76-T-MACH-102107	<a href="#">Quality Management</a>			Lanza
WT 24/25	76-T-MACH-102107	<a href="#">Quality Management</a>			Lanza

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Written Exam (60 min)

**Prerequisites**It is not possible to combine this brick with brick [Quality Management \[T-MACH-112586\]](#).

Below you will find excerpts from events related to this course:

V

**Quality Management**2149667, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)Lecture (V)  
Blended (On-Site/Online)

**Content**

Based on the quality philosophies Total Quality Management (TQM) and Six Sigma, the lecture deals with the requirements of modern quality management. Within this context, the process concept of a modern enterprise and the process-specific fields of application of quality assurance methods are presented. The lecture covers the current state of the art in preventive and non-preventive quality management methods in addition to manufacturing metrology, statistical methods and service related quality management. The content is completed with the presentation of certification possibilities and legal quality aspects.

Main topics of the lecture:

- The term "Quality"
- Total Quality Management (TQM) and Six Sigma
- Universal methods and tools
- QM during early product stages – product definition
- QM during product development and in procurement
- QM in production – manufacturing metrology
- QM in production – statistical methods
- QM in service
- Quality management systems
- Legal aspects of QM

**Learning Outcomes:**

The students ...

- are capable to comment on the content covered by the lecture.
- are capable of substantially quality philosophies.
- are able to apply the QM tools and methods they have learned about in the lecture to new problems from the context of the lecture.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about in the lecture for a specific problem.

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Organizational issues**

Vorlesungstermine montags 09:45 Uhr

Übung erfolgt während der Vorlesung

**Literature****Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt:

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

## T

## 8.216 Course: Rail System Technology [T-MACH-102143]

**Responsible:** Prof. Dr.-Ing. Martin Cichon  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101274 - Rail System Technology](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	9	Grade to a third	Each term	5

Events					
ST 2024	2115919	<a href="#">Rail System Technology</a>	2 SWS	Lecture /	Cichon
ST 2024	2115996	<a href="#">Rail Vehicle Technology</a>	2 SWS	Lecture /	Cichon
WT 24/25	2115919	<a href="#">Rail System Technology</a>	2 SWS	Lecture /	Cichon
WT 24/25	2115996	<a href="#">Rail Vehicle Technology</a>	2 SWS	Lecture /	Cichon
Exams					
ST 2024	76-T-MACH-102143	<a href="#">Rail System Technology</a>			Cichon, Ziesel, Berthold
ST 2024	76-T-MACH-102144	<a href="#">Rail System Technology</a>			Cichon
WT 24/25	76-T-MACH-102143	<a href="#">Rail System Technology</a>			Cichon

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

oral examination in German language

Duration. approx 50 minutes

No tools or reference materials may be used during the exam except calculator and dictionary

### Prerequisites

none

Below you will find excerpts from events related to this course:

## V

### Rail System Technology

2115919, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

1. Railway System: railway as system, subsystems and interdependencies, definitions, laws, rules, railway and environment, economic impact
2. Operation: Transportation, public transport, regional transport, long-distance transport, freight service, scheduling
3. Infrastructure: rail facilities, track alignment, railway stations, clearance diagram
4. Wheel-rail-contact: carrying of vehicle mass, adhesion, wheel guidance, current return
5. Vehicle dynamics: tractive and brake effort, driving resistance, inertial force, load cycles
6. Signaling and Control: operating procedure, succession of trains, European Train Control System, blocking period, automatic train control
7. Traction power supply: power supply of rail vehicles, comparison electric traction and diesel traction, dc and ac networks, system pantograph and contact wire, filling stations

### Organizational issues

ab SS 2024 schriftliche Prüfung

### Literature

Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

**Rail Vehicle Technology**2115996, SS 2024, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)  
On-Site****Content**

1. Vehicle system technology: structure and main systems of rail vehicles
2. Car body: functions, requirements, design principles, crash elements, coupling, doors and windows
3. Bogies: forces, running gears, bogies, Jakobs-bogies, active components, connection to car body, wheel arrangement
4. Drives: principles, electric drives (main components, asynchronous traction motor, inverter, with DC supply, with AC supply, without line supply, multisystem vehicles, dual mode vehicles, hybrid vehicles), non-electric drives
5. Brakes: basics, principles (wheel brakes, rail brakes, blending), brake control (requirements and operation modes, pneumatic brake, electropneumatic brake, emergency brake, parking brake)
6. Train control management system: definition of TCMS, bus systems, components, network architectures, examples, future trends
7. Vehicle concepts: trams, metros, regional trains, intercity trains, high speed trains, double deck vehicles, locomotives, freight wagons

**Organizational issues**

ab SS 2024 schriftliche Prüfung

**Literature**

Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

**Rail System Technology**2115919, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)  
On-Site****Content**

1. Railway System: railway as system, subsystems and interdependencies, definitions, laws, rules, railway and environment, economic impact
2. Operation: Transportation, public transport, regional transport, long-distance transport, freight service, scheduling
3. Infrastructure: rail facilities, track alignment, railway stations, clearance diagram
4. Wheel-rail-contact: carrying of vehicle mass, adhesion, wheel guidance, current return
5. Vehicle dynamics: tractive and brake effort, driving resistance, inertial force, load cycles
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**Literature**

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A bibliography is available for download (Ilias-platform).

**Rail Vehicle Technology**2115996, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)  
On-Site****Content**

1. Vehicle system technology: structure and main systems of rail vehicles
2. Car body: functions, requirements, design principles, crash elements, coupling, doors and windows
3. Bogies: forces, running gears, bogies, Jakobs-bogies, active components, connection to car body, wheel arrangement
4. Drives: principles, electric drives (main components, asynchronous traction motor, inverter, with DC supply, with AC supply, without line supply, multisystem vehicles, dual mode vehicles, hybrid vehicles), non-electric drives
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6. Train control management system: definition of TCMS, bus systems, components, network architectures, examples, future trends
7. Vehicle concepts: trams, metros, regional trains, intercity trains, high speed trains, double deck vehicles, locomotives, freight wagons

**Literature**

Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

T


## 8.217 Course: Rapid Industrialization of Immature Products using the Example of Electric Mobility [T-MACH-113031]

**Responsible:** Dr. Jörg Bauer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	4	Grade to a third	Each winter term	1 terms	1

Events					
WT 24/25	2149621	<a href="#">Rapid Industrialization of Immature Products using the Example of Electric Mobility</a>	2 SWS	Lecture / 	Bauer
Exams					
ST 2024	76-T-MACH-113031	<a href="#">Rapid Industrialization of Immature Products using the Example of Electric Mobility</a>			Bauer
WT 24/25	76-T-MACH-113031	<a href="#">Rapid Industrialization of Immature Products using the Example of Electric Mobility</a>			Bauer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Written Exam (60 min)

### Prerequisites

none

Below you will find excerpts from events related to this course:

V

### Rapid Industrialization of Immature Products using the Example of Electric Mobility

Lecture (V)  
On-Site

2149621, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Content**

The lecture "Rapid Industrialization of Immature Products using the Example of Electric Mobility" deals with production engineering methods for the robust and cost-effective production of technologically novel, so-called "immature" products. In this context, approaches for solving the central challenges resulting from the tension triangle of product development, industrialization and production are identified and discussed.

Based on the motivation for rapid market entry, the current approach involving stakeholders and other participants is explained. On this basis, key enablers for rapid and targeted industrialization are derived and discussed. For example, robust industrial processes based on flexible equipment are an essential core element for cost-effective production. Against this background, industry-relevant concepts for the automation and flexibilization of production processes are presented in the lecture in order to be able to deal efficiently and effectively with product-specific changes on the production side. Therefore, the main goal of an industrialization process is to develop production technologies and processes that enable robust, resource-efficient and cost-effective manufacturing of established and innovative products.

The lecture is structured as follows:

1. Motivation for rapid industrialization (complex market requirements, shortened development and product cycles, decreasing quantities per variant, ...).
2. Industrialization methods (simultaneous engineering, releases, frozen zones, high volumes, ...)
3. Key enablers to accelerate industrialization (simulation and digitalization, flexible and digital production equipment)
4. Supply chains and suppliers
5. Testing and deployment
6. Ramp-up

**Learning Outcomes:**

- The students are familiar with the essential elements of simultaneous engineering and industrialization (motivation, processes, fields of action, challenges).
- The Students know the key enablers for the rapid industrialization of immature products (digitization, flexible production equipment, rapid manufacturing processes for primary production).
- The Students are familiar with the basic principles, methods and procedures of the main enablers. The understanding is deepened through theory, case and practical examples.
- The toolbox of key enablers described in the lecture allows students to select and independently apply the enablers in the context of future challenges.
- The Students are able to disseminate and to apply the knowledge acquired during the lecture in their future working lives.

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Organizational issues**

Blockvorlesung im Januar/Februar 2025. Termine und Ort werden online bekannt gegeben. (<http://www.wbk.kit.edu/studium-und-lehre.php>).

Block course in January/February 2025. Timetable and location will be published online. (<http://www.wbk.kit.edu/studium-und-lehre.php>).

**Literature**

Foliensatz zur Veranstaltung wird über Ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

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## 8.218 Course: Remote Sensing, Exam [T-BGU-101636]





**Responsible:** Prof. Dr. Jan Cermak  
 Prof. Dr.-Ing. Stefan Hinz  
 Dr.-Ing. Uwe Weidner

**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences

**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	1

Events					
ST 2024	6020241	<a href="#">Remote Sensing Systems</a>	1 SWS	Lecture / 	Hinz, Cermak
ST 2024	6020242	<a href="#">Systems of Remote Sensing, Exercise</a>	1 SWS	Practice / 	Bork-Unkelbach
ST 2024	6020243	<a href="#">Procedures of Remote Sensing</a>	2 SWS	Lecture / 	Weidner
ST 2024	6020244	<a href="#">Procedures of Remote Sensing, Exercise</a>	1 SWS	Practice / 	Weidner
Exams					
ST 2024	8284101636	<a href="#">Remote Sensing, exam</a>			Weidner, Hinz

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

#### Recommendation

None



**8.219 Course: Renewable Energy-Resources, Technologies and Economics [T-WIWI-100806]**

**Responsible:** Prof. Dr. Patrick Jochem  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101464 - Energy Economics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each winter term	7

Events					
WT 24/25	2581012	<a href="#">Renewable Energy – Resources, Technologies and Economics</a>	2 SWS	Lecture /	Jochem
Exams					
ST 2024	7981012	<a href="#">Renewable Energy-Resources, Technologies and Economics</a>			Fichtner

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 minutes, in English, answers are possible in German or English) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

**Prerequisites**

None.

Below you will find excerpts from events related to this course:

**Renewable Energy – Resources, Technologies and Economics**

2581012, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

1. General introduction: Motivation, Global situation
2. Basics of renewable energies: Energy balance of the earth, potential definition
3. Hydro
4. Wind
5. Solar
6. Biomass
7. Geothermal
8. Other renewable energies
9. Promotion of renewable energies
10. Interactions in systemic context
11. Excursion to the "Energieberg" in Mühlburg

**Learning Goals:**

The student

- understands the motivation and the global context of renewable energy resources.
- gains detailed knowledge about the different renewable resources and technologies as well as their potentials.
- understands the systemic context and interactions resulting from the increased share of renewable power generation.
- understands the important economic aspects of renewable energies, including electricity generation costs, political promotion and marketing of renewable electricity.
- is able to characterize and where required calculate these technologies.

**Organizational issues**

Blockveranstaltung, freitags 14:00-17:00 Uhr, 25.10., 08.11., 22.11., 06.12., 20.12., 17.01., 31.01. 14.02.

**Literature****Weiterführende Literatur:**

- Kaltschmitt, M., 2006, Erneuerbare Energien : Systemtechnik, Wirtschaftlichkeit, Umweltaspekte, aktualisierte, korrigierte und ergänzte Auflage Berlin, Heidelberg : Springer-Verlag Berlin Heidelberg.
- Kaltschmitt, M., Streicher, W., Wiese, A. (eds.), 2007, Renewable Energy: Technology, Economics and Environment, Springer, Heidelberg.
- Quaschnig, V., 2010, Erneuerbare Energien und Klimaschutz : Hintergründe - Techniken - Anlagenplanung - Wirtschaftlichkeit München : Hanser, Ill.2., aktualis. Aufl.
- Harvey, D., 2010, Energy and the New Reality 2: Carbon-Free Energy Supply, Earthscan, London/Washington.
- Boyle, G. (ed.), 2004, Renewable Energy: Power for a Sustainable Future, 2nd Edition, Open University Press, Oxford.

T


## 8.220 Course: Seminar Application of Artificial Intelligence in Production [T-MACH-112121]




**Responsible:** Prof. Dr.-Ing. Jürgen Fleischer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each summer term	5

Events					
ST 2024	2150910	<a href="#">Seminar Application of Artificial Intelligence in Production</a>	2 SWS	Seminar / 	Fleischer
Exams					
ST 2024	76-T-MACH-112121	<a href="#">Seminar Application of Artificial Intelligence in Production</a>			Fleischer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Alternative test achievement (graded):

- Presentation of the results (approx. 20 min) followed by a colloquium (approx. 15 min) with weighting 25%
- Written processing of the results with weighting 75%

### Prerequisites

none

### Recommendation

Previous participation in the lecture 2149921 "Artificial Intelligence in Production" or advanced knowledge of Python.

Below you will find excerpts from events related to this course:

V

### Seminar Application of Artificial Intelligence in Production

2150910, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)  
On-Site

**Content**

The module AI in Production is designed to teach students the practical, holistic integration of machine learning methods and the application of artificial intelligence in production. The course is oriented towards the phases of the CRISP-DM process with the aim of developing a deep understanding of the necessary steps and content-related aspects (methods) within the individual phases. In addition to teaching the practical aspects of integrating the most important machine learning methods, the focus here is primarily on the necessary steps for data generation and data preparation as well as the implementation and validation of the methods in an industrial environment.

The lecture "Seminar Application of Artificial Intelligence in Production" aims at the practical integration of current machine learning methods based on realistic industrial use cases. The content framework of the lecture results from the holistic, practical implementation of an AI project in production. First, the necessary Deep Learning programming basics are taught using the Keras software package. Subsequently, practice-relevant use cases are defined, which are to be implemented practically with the methods of machine learning and especially deep learning.

**Learning Outcomes:**

## The Students

- are able to independently analyze a practical problem in production with regard to the application of machine learning methods.
- will be able to independently apply common deep learning algorithms to practical data sets, validate them, and analyze the results.
- understand the challenges of using deep learning methods in production.
- will know the main action areas and open research questions for the successful implementation of AI in production and for the implementation of autonomous machines.
- are able to evaluate the results of current deep learning methods and, based on these, to develop and practically apply proposed solutions (from the field of machine learning).

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Organizational issues**

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (<https://www.karlsruher-forschungsfabrik.de>) unterstützt.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (<https://www.karlsruher-forschungsfabrik.de/en.html>) to deepen the acquired knowledge.

**Literature**

Skript zur Veranstaltung wird über Ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

T

## 8.221 Course: Seminar Data-Mining in Production [T-MACH-108737]

**Responsible:** Prof. Dr.-Ing. Gisela Lanza**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-WIWI-101816 - Seminar Module](#)



Type
Examination of another type





Credits
3

Grading scale
Grade to a third

Recurrence
Each term

Version
1

Events					
ST 2024	2151643	<a href="#">Seminar Data Mining in Production</a>	2 SWS	Seminar / 	Lanza
WT 24/25	2151643	<a href="#">Seminar Data Mining in Production</a>	2 SWS	Seminar / 	Lanza
Exams					
ST 2024	76-T-MACH-108737	<a href="#">Seminar Data-Mining in Production</a>			Lanza
WT 24/25	76-T-MACH-108737	<a href="#">Seminar Data-Mining in Production</a>			Lanza

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

**Prerequisites**

none

**Annotation**The number of students is limited to twelve. Dates and deadlines for the seminar will be announced at <https://www.wbk.kit.edu/studium-und-lehre.php>.

Below you will find excerpts from events related to this course:

V

**Seminar Data Mining in Production**2151643, SS 2024, 2 SWS, Language: German, [Open in study portal](#)Seminar (S)  
On-Site

**Content**

In the age of Industry 4.0, large amounts of production data are generated by the global production networks and value chains. Their analysis enables valuable conclusions about production and lead to an increasing process efficiency. The aim of the seminar is to get to know production data analysis as an important component of future industrial projects. The students get to know the data mining tool KNIME and use it for analyses. A specific industrial use case with real production data enables practical work and offers direct references to industrial applications. The participants learn selected methods of data mining and apply them to the production data. The work within the seminar takes place in small groups on the computer. Subsequently, presentations on specific data mining methods have to be prepared.

**Learning Outcomes:**

The students ...

- can name, describe and distinguish between different methods, procedures and techniques of production data analysis.
- can perform basic data analyses with the data mining tool KNIME.
- can analyze and evaluate the results of data analyses in the production environment.
- are able to derive suitable recommendations for action.
- are able to explain and apply the CRISP-DM model.

**Workload:**

regular attendance: 10 hours

self-study: 80 hours

**Organizational issues**

Die Teilnehmerzahl ist auf zwölf Studierende begrenzt. Termine und Fristen zur Veranstaltung werden unter <https://www.wbk.kit.edu/studium-und-lehre.php> bekanntgegeben.

The number of students is limited to twelve. Dates and deadlines for the seminar will be announced at <https://www.wbk.kit.edu/studium-und-lehre.php>.

**Literature****Medien:**

KNIME Analytics Platform

**Media:**

KNIME Analytics Platform

**Seminar Data Mining in Production**

2151643, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)  
On-Site**

**Content**

In the age of Industry 4.0, large amounts of production data are generated by the global production networks and value chains. Their analysis enables valuable conclusions about production and lead to an increasing process efficiency. The aim of the seminar is to get to know production data analysis as an important component of future industrial projects. The students get to know the data mining tool KNIME and use it for analyses. A specific industrial use case with real production data enables practical work and offers direct references to industrial applications. The participants learn selected methods of data mining and apply them to the production data. The work within the seminar takes place in small groups on the computer. Subsequently, presentations on specific data mining methods have to be prepared.

**Learning Outcomes:**

The students ...

- can name, describe and distinguish between different methods, procedures and techniques of production data analysis.
- can perform basic data analyses with the data mining tool KNIME.
- can analyze and evaluate the results of data analyses in the production environment.
- are able to derive suitable recommendations for action.
- are able to explain and apply the CRISP-DM model.

**Workload:**

regular attendance: 10 hours

self-study: 80 hours

**Organizational issues**

Die Teilnehmerzahl ist auf zwölf Studierende begrenzt. Termine und Fristen zur Veranstaltung werden unter <https://www.wbk.kit.edu/studium-und-lehre.php> bekanntgegeben.

The number of students is limited to twelve. Dates and deadlines for the seminar will be announced at <https://www.wbk.kit.edu/studium-und-lehre.php>.

**Literature****Medien:**

KNIME Analytics Platform

**Media:**

KNIME Analytics Platform

## T

## 8.222 Course: Seminar in Business Administration (Bachelor) [T-WIWI-103486]

**Responsible:** Professorenschaft des Fachbereichs Betriebswirtschaftslehre

**Organisation:** KIT Department of Economics and Management

**Part of:** M-WIWI-101816 - Seminar Module





Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
ST 2024	2500020	Digital Democracy - Challenges and opportunities of the digital society	2 SWS	Seminar / ☼	Fegert
ST 2024	2500024	Biosignals in Information Systems & Marketing	2 SWS	Seminar / ☼	Knierim, del Puppo
ST 2024	2500027	Design Seminar: Digital Citizen Science	2 SWS	Seminar	Berens, Volkamer, Mädche
ST 2024	2500056	ABBA Summer School Seminar: Biosignal-Adaptive GenAI Systems	2 SWS	Seminar / ☼	Mädche
ST 2024	2500125	Human-Centered Systems Seminar: Engineering	3 SWS	Seminar / ☼	Mädche
ST 2024	2530293	Seminar in Finance (Bachelor, Prof. Ruckes)	2 SWS	Seminar / ☼	Ruckes, Luedecke, Benz, Kohl, Sarac
ST 2024	2530610	Seminar Financial Economics	2 SWS	Seminar / 🌑	Thimme
ST 2024	2540473	Business Data Analytics	2 SWS	Seminar	Hariharan
ST 2024	2540475	Platforms & Digital Experiences	2 SWS	Seminar	Knierim
ST 2024	2540478	Smart Grid Economics & Energy Markets	2 SWS	Seminar	Weinhardt
ST 2024	2540524	Bachelor Seminar in Data Science and Machine Learning	2 SWS	Seminar	Geyer-Schulz, Schweizer
ST 2024	2540553	User-Adaptive Systems Seminar	2 SWS	Seminar / ☼	Mädche, Beigl
ST 2024	2540557	Human-Centered Systems Seminar: Research	3 SWS	Seminar / ☼	Mädche
ST 2024	2545010	Entrepreneurship Basics (Track 1)	2 SWS	Seminar / 🌑	Hirte, Terzidis
ST 2024	2545011	Entrepreneurship Basics (Track 2)	2 SWS	Seminar / 🌑	Wohlfeil, Terzidis
ST 2024	2571187	Seminar Digital Marketing (Bachelor)	2 SWS	Seminar / 🌑	Kupfer
ST 2024	2579909	Seminar Management Accounting - Special Topics	2 SWS	Seminar / 🌑	Wouters, Jaedeke, Kepl
ST 2024	2579919	Seminar Management Accounting - Sustainability Topics	2 SWS	Seminar / 🌑	Letmathe
ST 2024	2581030	Seminar Energiewirtschaft IV	2 SWS	Seminar / 🌑	Fichtner, Sloot
ST 2024	2581977	Seminar Produktionswirtschaft und Logistik II	2 SWS	Seminar / 🌑	Volk, Schultmann
ST 2024	2581980	Seminar Energiewirtschaft II	2 SWS	Seminar / 🌑	Fichtner, Finck
WT 24/25	00063	Seminar Social Sentiment in Times of Crises	2 SWS	Seminar	Fegert
WT 24/25	2500006	Digital Citizen Science	2 SWS	Seminar / 🌑	Greif-Winzrieth
WT 24/25	2500045	Digital Democracy - Challenges and Opportunities of the Digital Society	2 SWS	Seminar / ☼	Fegert, Stein, Bezzaoui, Pekkip
WT 24/25	2500061	Special Topics in Transportation Strategy	2 SWS	Seminar / 🌑	Lindstädt
WT 24/25	2500125	Human-Centered Systems Seminar: Engineering	2 SWS	Seminar / ☼	Mädche
WT 24/25	2500165	Student2Startup	2 SWS	Seminar / ☼	Böhrer, Mohammadi



WT 24/25	2500215	Entrepreneurship Seasonal School	2 SWS	Block / 🎧	Weimar
WT 24/25	2530580	Seminar in Finance (Bachelor)	2 SWS	Seminar / 🎧	Uhrig-Homburg
WT 24/25	2530586			Seminar / 🎧	Uhrig-Homburg, Molnar
WT 24/25	2530610	Seminar in Financial Economics (Bachelor)	2 SWS	Seminar / 🔄	Thimme
WT 24/25	2540473	Business Data Analytics	2 SWS	Seminar / 🎧	Hariharan, Grote, Schulz, Motz
WT 24/25	2540475	Positive Information Systems	2 SWS	Seminar / 🎧	Knierim, del Puppo
WT 24/25	2540478	Smart Grids and Energy Markets	2 SWS	Seminar / 🎧	Weinhardt, Sammelmann, Miskiw
WT 24/25	2540524	Bachelor Seminar in Data Science and Machine Learning	2 SWS	Seminar	Geyer-Schulz, Nazemi
WT 24/25	2540557	Human-Centered Systems Seminar: Research	2 SWS	Seminar / 🔄	Mädche
WT 24/25	2545010	Entrepreneurship Basics (Track 1)	2 SWS	Seminar / 🔄	Hirte
WT 24/25	2545011	Entrepreneurship Basics (Track 2)	2 SWS	Seminar / 🔄	Wohlfeil
WT 24/25	2571180	Seminar in Marketing and Sales (Bachelor)	2 SWS	Seminar / 🎧	Klarmann, Mitarbeiter
WT 24/25	2573010	Seminar: Human Resources and Organizations (Bachelor)	2 SWS	Seminar / 🎧	Nieken, Mitarbeiter
WT 24/25	2573011	Seminar: Human Resource Management (Bachelor)	2 SWS	Seminar / 🎧	Nieken, Mitarbeiter
WT 24/25	2579919	Seminar Management Accounting - Sustainability Topics	2 SWS	Seminar / 🎧	Wouters, Dickemann
WT 24/25	2581030	Seminar in Energy Economics	2 SWS	Seminar / 🎧	Fichtner, Sloot
WT 24/25	2581976	Seminar in Production and Operations Management I	2 SWS	Seminar / 🎧	Schultmann, Rudi
WT 24/25	2581977	Seminar in Production and Operations Management II	2 SWS	Seminar / 🎧	Volk, Schultmann
WT 24/25	2581978	Seminar Produktionswirtschaft und Logistik III	2 SWS	Seminar / 🎧	Schultmann, Rosenberg
WT 24/25	2581979	Seminar in Energy Economics	2 SWS	Seminar / 🎧	Fichtner, Kleinebrahm
WT 24/25	2581980	Seminar in Energy Economics	2 SWS	Seminar / 🎧	Fichtner, Sandmeier
WT 24/25	2581981	Seminar in Energy Economics	2 SWS	Seminar / 🎧	Ardone, Fichtner, Slednev
<b>Exams</b>					
ST 2024	7900003	Seminar in Finance (Bachelor, Prof. Ruckes)			Ruckes
ST 2024	7900056	Entrepreneurship Basics (Track 1)			Terzidis
ST 2024	7900057	Entrepreneurship Basics (Track 2)			Terzidis
ST 2024	7900167	Design Seminar: Digital Citizen Science			Volkamer, Mädche
ST 2024	7900190	Human-Centered Systems Seminar: Engineering			Mädche
ST 2024	7900214	Seminar Business Data Analytics			Weinhardt
ST 2024	7900243	Seminar Digital Marketing (Bachelor)			Kupfer
ST 2024	7900256	Seminar Positive Information Systems			Weinhardt
ST 2024	7900261	Human-Centered Systems Seminar: Research			Mädche
ST 2024	7900265	User-Adaptive Systems Seminar			Mädche
ST 2024	7900281	Affective User Research for Human-AI Interaction			Mädche
ST 2024	7900314	Seminar Financial Economics "Behavioural Finance" (Bachelor)			Thimme
ST 2024	7900323	Market Design (BA)			Puppe
ST 2024	7900370	ABBA Summer School Seminar: Biosignal-Adaptive GenAI Systems			Mädche
ST 2024	79-2579909-B	Seminar Management Accounting - Special Topics (Bachelor)			Wouters
ST 2024	79-2579919-B	Seminar Management Accounting - Sustainability Topics (Bachelor)			Wouters
ST 2024	792581030	Seminar Energy Economics IV			Fichtner

ST 2024	792581031	Seminar Energy Economics V	Plötz
ST 2024	7981976	Seminar in Production and Operations Management I	Schultmann
ST 2024	7981978	Seminar in Production and Operations Management III	Schultmann
ST 2024	7981979	Seminar Energy Economics I	Fichtner
ST 2024	7981980	Seminar Energy Economics II	Fichtner
ST 2024	7981981	Seminar Energy Economics III	Fichtner
WT 24/25	7900069	Human-Centered Systems Seminar: Engineering	Mädche
WT 24/25	7900085	Entrepreneurship Basics (Track 1)	Terzidis
WT 24/25	7900087	Entrepreneurship Basics (Track 2)	Terzidis
WT 24/25	7900129	Special Topics in Transportation Strategy	Lindstädt
WT 24/25	7900138	Seminar in Marketing and Sales (Bachelor)	Klarmann
WT 24/25	7900146	Entrepreneurship Seasonal School	Terzidis
WT 24/25	7900157	Seminar Human Resources and Organizations (Bachelor)	Nieken
WT 24/25	7900161	Seminar Human Resource Management (Bachelor)	Nieken
WT 24/25	7900175	Seminar in Finance: How Retail Investors Influence Stock Markets - The Game Stop Case	Uhrig-Homburg
WT 24/25	7900203	Seminar "Finance in a nutshell"	Uhrig-Homburg
WT 24/25	7900233	Human-Centered Systems Seminar: Research	Mädche
WT 24/25	7900309	Student2Startup	Terzidis
WT 24/25	7981977	Seminar in Production and Operations Management II	Schultmann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

### Prerequisites

None.

### Recommendation


See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

### Annotation

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

Below you will find excerpts from events related to this course:




**Design Seminar: Digital Citizen Science**

2500027, SS 2024, 2 SWS, [Open in study portal](#)

**Seminar (S)**

### Content

TBA



**ABBA Summer School Seminar: Biosignal-Adaptive GenAI Systems**

2500056, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**  
**Blended (On-Site/Online)**

**Content**

**Background:** In the ABBA Summer School Seminar hosted at the Karlsruhe Decision & Design Lab (KD<sup>2</sup>Lab) at KIT, we aim to enable students to explore biosignal sensors for designing user-adaptive systems. This comprehensive three-day program is designed for both bachelor's and master's students who want to gain an understanding of biosignal and the development of user-adaptive systems. The learning objective is to design human-centered biosignal-adaptive systems to address user needs in learning scenarios.

**Course Content:** Throughout the summer school, students will learn the foundations of biosignal-adaptive systems through a series of lectures and apply the knowledge in practical group work. For the group work, we offer students two contexts for their research topics: literature research during thesis writing and programming with LLM. Aiming to address user challenges in these two contexts, we provide two biosignal sensors: EEG or eye-tracking sensors. By collecting biosignal data with the sensors, we encourage students to integrate cutting-edge AI algorithms for their design and implementation. In the end, students should present their results to showcase the functionality, innovation, and a prototype of their biosignal-adaptive systems.

**Learning Outcome:** By successfully achieving the learning objective, students will receive a certificate from KIT and will have the opportunity to apply their acquired skills and knowledge for further research.

The seminar will be held in a three-day format from 23th to 25th September with 3 ECTS. For any questions, please ask Luke ([shi.liu@kit.edu](mailto:shi.liu@kit.edu)) for more information!

**Human-Centered Systems Seminar: Engineering**2500125, SS 2024, 3 SWS, Language: English, [Open in study portal](#)**Seminar (S)  
Blended (On-Site/Online)****Content**

Formerly known as "Current Topics in Digital Transformation"

With this seminar, we aim to provide students with the possibility to independently work on state-of-the-art research topics in addition to the knowledge gained in the lectures of the human-centered systems lab (Prof. Mädche). Students will work on a dedicated topic in the context of human-centered systems and apply a pre-defined research method. A broad spectrum of topics is offered every semester, topics may range from creating an experimental design, analyzing collected data, or systematically comparing existing software prototypes in a specific field of interest.

**User-Adaptive Systems Seminar**2540553, SS 2024, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)  
Blended (On-Site/Online)****Content**

User-adaptive systems collect and analyze biosignals from users to recognize user states as a basis for adaptation. Thermic, mechanical, electric, acoustic, and optical signals are collected using sensors which are integrated in wearables, e.g. glasses, earphones, belts, or bracelets. The collected data is processed with analytics and machine learning techniques in order to determine short-term, evolving over time, and long-term user states in the form of user characteristics, affective-cognitive states, or behavior. Finally, the recognized user states are leveraged for realizing user-centric adaptations.

In this seminar, interdisciplinary teams of students design, develop, and evaluate a user-adaptive system prototype leveraging state-of-the-art hard- and software. This seminar follows an interdisciplinary approach. Students from the fields of computer science, information systems and industrial engineering & management collaborate in the prototype design, development, and evaluation.

The seminar is carried out in cooperation between Teco/Chair of Pervasive Computing Systems (Prof. Beigl) and the Institute of Information Systems and Marketing (h-lab, Prof. Mädche). It is offered as part of the DFG-funded graduate school "KD2School: Designing Adaptive Systems for Economic Decisions" (<https://kd2school.info/>)

Learning objectives of the seminar

- Explain what a user-adaptive system is and how it can be conceptualized
- Suggest and evaluate different design solutions for addressing the identified problem
- Build a user-adaptive system prototype using state-of-the-art hard- and software
- Perform a user-centric evaluation of the user-adaptive system prototype

**Prerequisites**

Strong analytical abilities and profound software development skills are required.

**Organizational issues**

Termine werden bekannt gegeben

**Literature**

Required literature will be made available in the seminar.

**Human-Centered Systems Seminar: Research**2540557, SS 2024, 3 SWS, Language: English, [Open in study portal](#)**Seminar (S)**  
**Blended (On-Site/Online)****Content**

Formerly known as "Information Systems and Service Design Seminar"

With this seminar, we aim to provide students with the possibility to independently work on state-of-the-art research topics in addition to the knowledge gained in the lectures of the research group IS I (Prof. Mädche). The research group "Information Systems I" (IS I) headed by Prof. Mädche focuses in research, education, and innovation on designing interactive intelligent systems. It is positioned at the intersection of Information Systems and Human-Computer Interaction (HCI).

In the seminar, participants will get deeper insights in a contemporary research topic in the field of information systems, specifically interactive intelligent systems.

The actual seminar topics will be derived from current research activities of the research group. Our research assistants offer a rich set of topics from our research clusters (digital experience and participation, intelligent enterprise systems, or digital services design & innovation). Students can select among these topics individually depending on their personal interests. The seminar is carried out in the form of a literature-based thesis project. In the seminar, students will acquire the important methodological skills of running a systematic literature review.

**Learning Objectives**

- focus on a contemporary topic at the intersection of Information Systems and Human-Computer Interaction (HCI), specifically interactive intelligent systems
- carry out a structured literature search for a given topic
- aggregate the collected information in a suitable way to present and extract knowledge
- write a seminar thesis following academic writing standards
- deliver a presentation in a scientific context in front of an auditorium

**Prerequisites**

No specific prerequisites are required for the seminar.

**Literature**

Further literature will be made available in the seminar.

**Organizational issues**

Termine werden bekannt gegeben

**Entrepreneurship Basics (Track 1)**2545010, SS 2024, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)**  
**On-Site**

**Content****Content**

This seminar explains important factors for becoming an entrepreneur and guides you through a structured process from the first business idea to a pitch of your final business model. Therefore, a business idea will be developed in the context of the UN Sustainable Development Goals. In small teams you create, develop, validate and present your business model. It simulates the basics of a start-up process up to the investor pitch.

**Learning Objectives**

After completing this course, the course participants will be able to

- Reflect on and define your personal and team core values
- Reflect on and define your personal and team competencies
- Reflect on and recall a definition for business opportunity
- Define your field of interest for opportunity recognition using the UN SDGs
- Analyze a specific domain to identify business opportunities
- Develop a first draft for your business model by using the Business Model Canvas
- Pitch / present your business idea

**Exam:**

Presentation + active participation + paper.


**Target group:**

Bachelor students

**Organizational issues**

Registration is via the Wiwi-Portal.

In the seminar you will work on a project in teams of max. 5 persons. The groups are formed in the seminar.

	<p><b>Entrepreneurship Basics (Track 2)</b> 2545011, SS 2024, 2 SWS, Language: English, <a href="#">Open in study portal</a></p>	<p><b>Seminar (S)</b> <b>On-Site</b></p>
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**Content****Course Content:**

This seminar shows what is important for entrepreneurs and it guides you through a structured process from the first business idea to a pitch of your final business model. In teams you create, develop, validate and present your business model. It partially simulates a start-up process up to the investor pitch.

Starting with a rough business idea, you learn to understand and validate the customer problems. Together with your teammates and the feedback from the other teams and the lecturer, you will create a sharp business model by using tools like the Value Proposition Canvas, the Business Model Canvas and customer interviews. With some further information about rapid prototyping and structuring a pitch and a one-pager for business angels, you will learn, how to present the developed business. This seminar is teamwork. You grow as a team, learn to communicate and to work efficient in a team so all your results (the pitch and the written outline) are presented by the team.

**Learning Objectives**

- Learning of entrepreneurial skills.
- Understanding of value creation importance.
- Experience on how to derive and test hypothesis.
- Transition from ideas to a business model that works.
- Learning how to pitch and to convince investors.

**Exam:**

Presentation + active participation + paper.

**Target group:**

Bachelor students

**Organizational issues**

Saturday, 20.04.2024, 10.00 - 17.00

Saturday, 04.05.2024, 10.00 - 17.00

Saturday, 01.06.2024, 10.00 - 12.30

Registration is via the Wiwi-Portal.

In the seminar you will work on a project in teams of max. 5 persons. Team applications are welcome but not a prerequisite for participation.

**Seminar Management Accounting - Special Topics**2579909, SS 2024, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)  
On-Site****Content**

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.

**Learning objectives:**

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

**Workload:**

- The total workload for this course is approximately 90 hours. For further information see German version.

**Examination:**

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade is made up of the grade of the seminar paper, the presentation and the contributions in the seminar sessions.

**Required prior Courses:**

- The course requires a basic knowledge of finance and accounting.

**Note:**

- Maximum of 16 students.

**Organizational issues**

Geb.05.20, 2A-12.1; Termine werden bekannt gegeben

**Literature**

Will be announced in the course.

**Seminar Management Accounting - Sustainability Topics**2579919, SS 2024, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)  
On-Site**

**Content**

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscbed. The seminar course is concentrated in several meetings that are spread throughout the semester.

**Learning objectives:**

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

**Workload:**

- The total workload for this course is approximately 90 hours. For further information see German version.

**Examination:**

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade is made up of the grade of the seminar paper, the presentation and the contributions in the seminar sessions.

**Required prior Courses:**

- The course requires a basic knowledge of finance and accounting.

**Note:**


- Maximum of 8 students.

**Organizational issues**

Geb.05.20, 2A-12.1; Termine werden bekannt gegeben

**Literature**

Will be announced in the course.

 <b>Student2Startup</b> 2500165, WS 24/25, 2 SWS, Language: English, <a href="#">Open in study portal</a>	<b>Seminar (S)</b> <b>Blended (On-Site/Online)</b>
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**Content****Content:**

In this seminar, five pre-seed startup projects will define strategic challenges and ask students to work on solutions. Mentors from the industry will support the teams. In addition to a kick-off and final event, we will organize regular seminar sessions to provide background and help the student teams in their tasks.

**Learning Objectives:**

After completing this course, the course participants will be able to

- Understand and apply basic concepts of entrepreneurship, including business modeling, lean startup approaches, and market analysis
- Work in a team, organize the division of labor into separate tasks, and coordinate the tasks to attain a result
- Understand specific challenges of startup projects
- Interact with experts from the industry and potential users to develop answers/solutions to a given challenge
- Present the results to the startups and experts from the industry

**Exam:**

Team presentation at the final event, detailed presentation appendix with background information, and active participation in all sessions

**Target group:**

Bachelor students

**Organizational issues**

Registration is via the Wiwi-Portal.

In the seminar, you will work on a project in teams of max five people. The groups are formed in the seminar.

**Entrepreneurship Seasonal School**2500215, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)**Block (B)**  
**On-Site****Content**

During the Entrepreneurship Seasonal School, students develop a business model based on innovative technologies and social problems in workshops in international teams for one week.

**Course Content:**

The Entrepreneurship Seasonal School brings together students from different universities to spend a week strengthening their knowledge of digital entrepreneurship in healthcare. Experience the life of an entrepreneur and learn how to attain resources to realize a product vision. During one week, you will develop a range of entrepreneurial competences crucial for establishing a successful venture. Our primary focus is on digital healthcare ventures, granting you the opportunity to delve into the realm of entrepreneurship within the healthcare system. By gaining a deep understanding of healthcare needs, you will utilize creativity techniques to uncover potential business ideas that provide value for patients and doctors. Additionally, you will learn how to create viable business models, dive into health regulations, and pitch your idea to a jury.

In WS 2023/24 the one-week program is being hosted by the Karlsruhe Institute of Technology, with co-teaching support from the Eucor partners University of Basel and the University of Strasbourg.

In the seminar you will work on a project in teams of max. 5 persons.

**Learning Objectives:**

After attending the event, you will be able to...

- describe the role of entrepreneurship
- develop innovative and technology-based solutions for societal problems,
- develop a viable business model for a problem,
- present a business idea to a panel of judges,
- and be empowered to work independently in multidisciplinary and multicultural teams

**Organizational issues**

Expected date: 17.02.25 – 21.02.25, Details will be announced later. Registration via wiwi portal.

2530586, WS 24/25, SWS, Language: German, [Open in study portal](#)**Seminar (S)**  
**On-Site****Content**

Within this seminar eLearning videos are produced to different topics out of the contents of our lectures. The student gets in touch with scientific work. Through profound working on a specific scientific topic the student is meant to learn the foundations of scientific research and reasoning in particular in finance. Through conduction of the video the student becomes familiar with the fundamental techniques for presentations and foundations of scientific reasoning. In addition, the student earns rhetorical skills.

The success is monitored by the development of an eLearning video and by the writing of a project report (according to §4(2), 3 SPO).

The overall grade is made up of these partial performances.

**Recommendations:**

Knowledge of the content of the modules *Essentials of Finance* [WW3BWLFBV1] (for bachelor students) and *F1 (Finance)* [WW4BWLFBV1] (for master students) is assumed.

The total workload for this course is approximately 90 hours. For further information see German version.

**Organizational issues**

Kickoff am 21.10.24 um 16 Uhr, Zwischenpräsentation am 10.12.24, 16 Uhr und Abschlusspräsentation am 21.01.25, 17:45 Uhr am Campus B (Geb. 09.21), Raum 209

**Business Data Analytics**2540473, WS 24/25, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)**  
**On-Site****Content**

wird auf deutsch und englisch gehalten

**Organizational issues**

Blockveranstaltung, siehe WWW



**Bachelor Seminar in Data Science and Machine Learning**2540524, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Literature****Weiterführende Literatur:**

- W. Thomson. A Guide for the Young Economist. The MIT Press, 2001
- D.J. Brauner, H.-U. Vollmer. Erfolgreiches wissenschaftliches Arbeiten. Verlag Wissenschaft & Praxis, 2004
- University of Chicago Press. The Chicago Manual of Style. University of Chicago Press, 13th ed., 1982
- American Psychological Association. Concise of Rules of APA Style. American Psychological Association, 2005
- American Psychological Association. Publication Manual of the American Psychological Association. American Psychological Association, 2001

**Entrepreneurship Basics (Track 1)**2545010, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)Seminar (S)  
Blended (On-Site/Online)**Content****Course Content:**

This seminar explains important factors for becoming an entrepreneur and guides you through a structured process from the first business idea to a pitch of your final business model. Therefore, a business idea will be developed in the context of the UN Sustainable Development Goals. In small teams you create, develop, validate and present your business model. It simulates the basics of a start-up process up to the investor pitch.

**Learning Objectives**

After completing this course, the course participants will be able to

- Reflect on and define your personal and team core values
- Reflect on and define your personal and team competencies
- Reflect on and recall a definition for business opportunity
- Define your field of interest for opportunity recognition using the UN SDGs
- Analyze a specific domain to identify business opportunities
- Develop a first draft for your business model by using the Business Model Canvas
- Pitch / present your business idea

**Credentials:**

Registration is via the Wiwi portal.

**Exam:**

Presentation + active participation + paper.

**Target group:**

Bachelor students

**Organizational issues**

Registration is via the Wiwi portal.

In the seminar you will work on a project in teams of max. 5 persons. The groups are formed in the seminar

**Entrepreneurship Basics (Track 2)**2545011, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)Seminar (S)  
Blended (On-Site/Online)

**Content****Course Content:**

The seminar introduces the basics of planning and modeling of business ideas. Based on a structured process, you will be guided through the development of your own business ideas, the derivation and testing of initial business model hypotheses, and the final creation of a business plan. In small teams you will create, develop, validate and present your business model. The basic steps of a start-up process are simulated.

**Learning Objectives**

After completing this seminar, students will have learned and actually practiced the whole business model development process. In particular this means that students will know:

- how business ideas are created and how they can be developed
- what the value proposition of a business idea is
- how a business model hypothesis can be generated and tested
- which successful business model patterns exist and how they can be used for one's own business
- how to pitch business ideas and convince potential investors

**Credentials:**

Registration is via the Wiwi portal.

**Exam:**

Presentation + active participation + paper.

**Target group:**

Bachelor students

**Organizational issues**

Registration is via the Wiwi portal.

In the seminar you will work on a project in teams of 4-5 persons. The groups are formed in the seminar.

<b>V</b>	<b>Seminar: Human Resources and Organizations (Bachelor)</b> 2573010, WS 24/25, 2 SWS, Language: German, <a href="#">Open in study portal</a>	<b>Seminar (S)</b> <b>On-Site</b>
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**Content**

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

**Aim**

The student

- looks critically into current research topics in the fields of human resources and organizations.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

**Workload**

The total workload for this course is: approximately 90 hours.

Lecture: 30h

Preparation of lecture: 45h

Exam preparation: 15h

**Literature**

Selected journal articles and books.

**Organizational issues**

Blockveranstaltung siehe Homepage

<b>V</b>	<b>Seminar: Human Resource Management (Bachelor)</b> 2573011, WS 24/25, 2 SWS, Language: German, <a href="#">Open in study portal</a>	<b>Seminar (S)</b> <b>On-Site</b>
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**Content**

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

**Aim**

The student

- looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

**Workload**

The total workload for this course is: approximately 90 hours.

Lecture: 30h

Preparation of lecture: 45h

Exam preparation: 15h

**Literature**

Selected journal articles and books.

**Organizational issues**

Blockveranstaltung siehe Homepage



### Seminar Management Accounting - Sustainability Topics

2579919, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)  
On-Site

**Content**

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in several meetings that are spread throughout the semester.

**Learning objectives:**

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

**Examination:**

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade is made up of the grade of the seminar paper, the presentation and the contributions in the seminar sessions.

**Required prior Courses:**

- The course requires a basic knowledge of finance and accounting.

**Workload:**

- The total workload for this course is approximately 90 hours. For further information see German version.

**Note:**

- Maximum of 8 students.

**Organizational issues**

Ort und Zeit werden noch bekannt gegeben bzw. über ILIAS

**Literature**

Will be announced in the course.

**8.223 Course: Seminar in Economics (Bachelor) [T-WIWI-103487]****Responsible:** Professorenschaft des Fachbereichs Volkswirtschaftslehre**Organisation:** KIT Department of Economics and Management**Part of:** M-WIWI-101816 - Seminar Module

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
ST 2024	2500004	Predictive Data Analytics - An Introduction to Statistical Machine Learning	2 SWS	Seminar / 🎧	Schienle, Lerch
ST 2024	2500009	Seminar in Economic Theory I	2 SWS	Seminar / 🎧	Ammann, Kretz, Okulicz
ST 2024	2520367	Strategische Entscheidungen	2 SWS	Seminar / 🔄	Ehrhart
ST 2024	2520535	Seminar in Economic Theory I	2 SWS	Seminar / 🎧	Ammann, Kretz, Okulicz
ST 2024	2560130	Seminar Public Finance	2 SWS	Block / 🔄	Wigger, Schmelzer
ST 2024	2560241	Digital IT Solutions and Services transforming the Field of Public Transportation	2 SWS	Seminar	Janoshalmi
ST 2024	2560259	Organisation and Management of Development Projects	2 SWS	Seminar / 🔄	Sieber
ST 2024	2560400	Seminar in Macroeconomics I	2 SWS	Seminar / 🔄	Brumm, Krause, Pegorari
ST 2024	2560553	Seminar Shaping AI and Digitization for Society (Bachelor)	2 SWS	Seminar / 🔄	Zhao
WT 24/25	2520405	Topics in Experimental Economics		Seminar / 🎧	Reiß, Peters
WT 24/25	2520561	Wirtschaftstheoretisches Seminar I (Bachelor)	2 SWS	Seminar / 🔄	Puppe, Ammann, Kretz, Okulicz
WT 24/25	2520562	Wirtschaftstheoretisches Seminar II (Bachelor)	2 SWS	Seminar / 🔄	Puppe, Ammann, Kretz
WT 24/25	2521310	Topics in Econometrics	2 SWS	Seminar	Schienle, Krüger, Rüter
WT 24/25	2560130	Seminar Public Finance	2 SWS	Seminar / 🔄	Wigger, Schmelzer
WT 24/25	2560140	Seminar Game Theory and Behavioral Economics (Bachelor)	2 SWS	Seminar / 🎧	Rau, Rosar
WT 24/25	2560141	AI and Digitization for Society (Bachelor)	2 SWS	Seminar / 🔄	Zhao
WT 24/25	2560400	Seminar in Macroeconomics I	2 SWS	Seminar / 🔄	Brumm, Pegorari, Frank
WT 24/25	2561208	Selected aspects of European transport planning and -modelling	2 SWS	Seminar	Szimba
Exams					
ST 2024	7900004	Predictive Data Analytics - An Introduction to Statistical Machine Learning			Lerch
ST 2024	7900051	Seminar in Economic Policy			Ott
ST 2024	7900130	Shaping AI and Digitization for Society (Bachelor)			Puppe
ST 2024	7900164	Seminar in Economics (Bachelor)			Mitusch
ST 2024	7900319	Seminar in Economics (Bachelor)			Ehrhart
ST 2024	7900363	Seminar in Macroeconomics I: Macroeconomic Implications of Artificial Intelligence			Brumm
ST 2024	7900369	Seminar on Topics in Digital Economics			Reiß, Hillenbrand
ST 2024	79100005	Topics in Experimental Economics			Reiß

ST 2024	79sefi1	<a href="#">Seminar Public Finance (Bachelor)</a>	Wigger
WT 24/25	7900124	<a href="#">Seminar Game Theory and Behavioral Economics (Bachelor)</a>	Puppe
WT 24/25	7900212	<a href="#">Seminar in Economic Policy</a>	Ott
WT 24/25	7900278	<a href="#">Seminararbeit AI and Digitization for Society (Bachelor)</a>	Puppe
WT 24/25	79sefi1	<a href="#">Seminar Public Finance (Bachelor)</a>	Wigger

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

### Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

### Prerequisites

None.

### Recommendation

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

### Annotation

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

Below you will find excerpts from events related to this course:

**Predictive Data Analytics - An Introduction to Statistical Machine Learning**

2500004, SS 2024, 2 SWS, Language: German/English, [Open in study portal](#)

**Seminar (S)**  
On-Site

### Organizational issues

Blockveranstaltung, Termine werden bekannt gegeben

**Seminar Public Finance**

2560130, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

**Block (B)**  
Blended (On-Site/Online)

### Content

See German version.

### Organizational issues

Termine werden bekannt gegeben.

### Literature

Literatur wird zu Beginn des jeweiligen Seminars vorgestellt.

**Seminar Shaping AI and Digitization for Society (Bachelor)**

2560553, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**  
Blended (On-Site/Online)

**Content**

Participation will be limited to 12 students.

For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Economathematics.

Objective: The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

The acceptance of students for the seminar is based on preferences and suitability for the topics. This includes theoretical and practical experience with Behavioral Economics as well as English skills.

Grading: Seminar Papers of 8–10 pages are to be handed in.

Students' grades will be based on the quality of presentations in the seminar (40%) and the seminar paper (60%). Students can improve their grades by actively participating in the discussions of the presentations.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

**Organizational issues**

Registration via WiWi-Portal

Blockveranstaltungen:

Introductory Meeting April 17 (online)

Seminar Presentations June 14 (in person) KD2Lab Team Room

**Topics in Experimental Economics**

2520405, WS 24/25, SWS, Language: German/English, [Open in study portal](#)

Seminar (S)  
On-Site

**Organizational issues**

Blockseminar; Blücherstraße 17; Termine werden separat bekannt gegeben

**Literature**

Als Pflichtliteratur dienen ausgewählte Paper.

**Topics in Econometrics**

2521310, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Organizational issues**

Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben

**Seminar Game Theory and Behavioral Economics (Bachelor)**

2560140, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)  
On-Site

**Content**

For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Economathematics.

Objective: The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

Seminar Papers of 8–10 pages are to be handed in.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

**Organizational issues**

Application is possible via <https://portal.wiwi.kit.edu/Seminare>

Kick-off: 23.10.24, 14.00 - 15.30 h, Geb. 01.85, KD2 Lab (1. floor über Außentreppe), Team Room

Presentations: 13.01.2025 08.00 - 13.00 h, 01.85, KD2 Lab (1. floor über Außentreppe), Team Room

**AI and Digitization for Society (Bachelor)**

2560141, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)  
Blended (On-Site/Online)

**Content**

For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Economathematics.

The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

Seminar Papers of 8–10 pages are to be handed in.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

**Organizational issues**

Application is possible via <https://portal.wiwi.kit.edu/Seminare>

Kick-off: 23.10.2024, 11.00 - 12.00 (online)

Presentations: 17.01.2025, 08.00 - 13.00 h, Geb. 01.85, KD2Lab Team room

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**8.224 Course: Seminar in Engineering Science Master (approval) [T-WIWI-108763]****Responsible:** Fachvertreter ingenieurwissenschaftlicher Fakultäten**Organisation:** KIT Department of Economics and Management**Part of:** [M-WIWI-101816 - Seminar Module](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

**Competence Certificate**

See German version.

**Prerequisites**

See module description.

**Recommendation**

None



**8.225 Course: Seminar in Informatics (Bachelor) [T-WIWI-103485]**

**Responsible:** Professorenschaft des Instituts AIFB  
**Organisation:** KIT Department of Economics and Management  
**Part of:** M-WIWI-101816 - Seminar Module

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
ST 2024	2513308	Seminar Knowledge Discovery and Data Mining (Bachelor)	3 SWS	Seminar / ●	Färber, Noullet, Saier, Popovic, Qu, Käfer, Shao, Kinder
ST 2024	2513310	Seminar Data Science & Real-time Big Data Analytics (Bachelor)	2 SWS	Seminar / ●	Färber, Käfer, Thoma
ST 2024	2513402	Seminar Emerging Trends in Internet Technologies (Bachelor)	2 SWS	Seminar / ☒	Sunyaev, Toussaint, Brecker, Danylak
ST 2024	2513404	Seminar Emerging Trends in Digital Health (Bachelor)	2 SWS	Seminar / ☒	Sunyaev, Toussaint, Brecker, Danylak
ST 2024	2513500	Cognitive Automobiles and Robots	2 SWS	Seminar / ●	Schneider, Zöllner, Daaboul
WT 24/25	2513200	Seminar Programming 3 (Bachelor)	2 SWS	Seminar / ●	Oberweis, Fritsch, Frister, Forell, Rybinski
WT 24/25	2513214	Seminar Information security and Data protection (Bachelor)	2 SWS	Seminar / ●	Volkamer, Raabe, Schiefer, Hennig, Sterz, Werner, Ullrich
WT 24/25	2513312	Seminar Linked Data and the Semantic Web (Bachelor)	3 SWS	Seminar / ●	Käfer, Braun
WT 24/25	2513314	Seminar Real-World Challenges in Data Science and Analytics (Bachelor)	3 SWS	/ ●	Käfer, Höllig, Thoma
WT 24/25	2513315	Seminar Real-World Challenges in Data Science and Analytics (Master)	3 SWS	/ ●	Käfer, Höllig, Thoma
Exams					
ST 2024	7900090	Seminar Data Science & Real-time Big Data Analytics (Bachelor)			Färber
ST 2024	7900094	Seminar Knowledge Discovery and Data Mining (Bachelor)			Käfer
ST 2024	7900136	Seminar Emerging Trends in Digital Health (Bachelor)			Sunyaev
ST 2024	7900187	Seminar Emerging Trends in Internet Technologies (Bachelor)			Sunyaev
ST 2024	7900265	User-Adaptive Systems Seminar			Mädche
WT 24/25	7900038	Seminar Linked Data and the Semantic Web (Bachelor)			Färber
WT 24/25	7900042	Seminar Programming 3 (Bachelor)			Oberweis
WT 24/25	7900121	Security and Privacy Awareness			Volkamer
WT 24/25	7900187	Seminar Real-World Challenges in Data Science and Analytics (Bachelor)			Färber
WT 24/25	7900284	Seminar Information Security and Data Protection (Bachelor)			Oberweis

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

**Prerequisites**

None.

**Recommendation**


See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

**Annotation**

Placeholder for seminars offered by the Institute AIFB. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

Below you will find excerpts from events related to this course:

	<b>Seminar Knowledge Discovery and Data Mining (Bachelor)</b> 2513308, SS 2024, 3 SWS, Language: English, <a href="#">Open in study portal</a>	<b>Seminar (S)</b> <b>On-Site</b>
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**Content**

In this seminar different machine learning and data mining methods are implemented.

The seminar includes different methods of machine learning and data mining. Participants of the seminar should have basic knowledge of machine learning and programming skills.

Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market
- Scientific Publications

Further Information: [https://aifb.kit.edu/web/Lehre/Praktikum\\_Knowledge\\_Discovery\\_and\\_Data\\_Science](https://aifb.kit.edu/web/Lehre/Praktikum_Knowledge_Discovery_and_Data_Science)

The exact dates and information for registration will be announced at the event page.

**Organizational issues**


Die Anmeldung erfolgt über das WiWi Portal <https://portal.wiwi.kit.edu/>.

Für weitere Fragen bezüglich des Seminar und der behandelten Themen wenden Sie sich bitte an die entsprechenden Verantwortlichen.

**Literature**

Detaillierte Referenzen werden zusammen mit den jeweiligen Themen angegeben. Allgemeine Hintergrundinformationen ergeben sich z.B. aus den folgenden Lehrbüchern:

- Mitchell, T.; Machine Learning
- McGraw Hill, Cook, D.J. and Holder, L.B. (Editors) Mining Graph Data, ISBN:0-471-73190-0
- Wiley, Manning, C. and Schütze, H.; Foundations of Statistical NLP, MIT Press, 1999.

	<b>Seminar Data Science &amp; Real-time Big Data Analytics (Bachelor)</b> 2513310, SS 2024, 2 SWS, Language: English, <a href="#">Open in study portal</a>	<b>Seminar (S)</b> <b>On-Site</b>
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**Content**

In this seminar, students will design applications in teams that use meaningful and creative Event Processing methods. Thereby, students have access to an existing record.

Event processing and real-time data are everywhere: financial market data, sensors, business intelligence, social media analytics, logistics. Many applications collect large volumes of data in real time and are increasingly faced with the challenge of being able to process them quickly and react promptly. The challenges of this real-time processing are currently also receiving a great deal of attention under the term "Big Data". The complex processing of real-time data requires both knowledge of methods for data analysis (data science) and their processing (real-time analytics). Seminar papers are offered on both of these areas as well as on interface topics, the input of own ideas is explicitly desired.

Further information to the seminar is given under the following Link:

<http://seminar-cep.fzi.de>

Questions are answered via the e-mail address [sem-ep@fzi.de](mailto:sem-ep@fzi.de).

**Organizational issues**

Questions are answered via the e-mail address [sem-ep@fzi.de](mailto:sem-ep@fzi.de).

**Cognitive Automobiles and Robots**2513500, SS 2024, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)**  
**On-Site****Content**

The seminar is intended as a theoretical supplement to lectures such as "Machine Learning". The theoretical basics will be deepened in the seminar. The aim of the seminar is that the participants work individually to analyze a subsystem from the field of robotics and cognitive systems using one or more procedures from the field of AI/ML.

The individual projects require the analysis of the task at hand, selection of suitable procedures, specification and theoretical evaluation of the approach taken. Finally, the chosen solution has to be documented and presented in a short presentation.

**Learning objectives:**

- Students can apply knowledge from the Machine Learning lecture in a selected field of current research in robotics or cognitive automobiles for theoretical analysis.
- Students can evaluate, document and present their concepts and results.

**Recommendations:**

Attendance of the lecture machine learning

**Workload:**

The workload of 3 credit points consists of the time spent on literature research and planning/specifying the proposed solution. In addition, a short report and a presentation of the work carried out will be prepared.

**Organizational issues**

Anmeldung und weitere Informationen sind im Wiwi-Portal zu finden.

Registration and further information can be found in the WiWi-portal.

**Seminar Programming 3 (Bachelor)**2513200, WS 24/25, 2 SWS, [Open in study portal](#)**Seminar (S)**  
**On-Site****Content**

Registration information and the content of the seminar will be announced on the WIWI-portal. Only bachelor students are allowed to attend this seminar.

**Seminar Linked Data and the Semantic Web (Bachelor)**2513312, WS 24/25, 3 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)**  
**On-Site****Content**

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this practical seminar is to build applications and devise algorithms that consume, provide, or analyse Linked Data.

The Linked Data principles are a set of practices for data publishing on the web. Linked Data builds on the web architecture and uses HTTP for data access, and RDF for describing data, thus aiming towards web-scale data integration. There is a vast amount of data available published according to those principles: recently, 4.5 billion facts have been counted with information about various domains, including music, movies, geography, natural sciences. Linked Data is also used to make web-pages machine-understandable, corresponding annotations are considered by the big search engine providers. On a smaller scale, devices on the Internet of Things can also be accessed using Linked Data which makes the unified processing of device data and data from the web easy.

In this practical seminar, students will build prototypical applications and devise algorithms that consume, provide, or analyse Linked Data. Those applications and algorithms can also extend existing applications ranging from databases to mobile apps.

For the seminar, programming skills or knowledge about web development tools/technologies are highly recommended. Basic knowledge of RDF and SPARQL are also recommended, but may be acquired during the seminar. Students will work in groups. Seminar meetings will take place as 'Block-Seminar'.

Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

The exact dates and information for registration will be announced at the event page.

**Seminar Real-World Challenges in Data Science and Analytics (Bachelor)**2513314, WS 24/25, 3 SWS, Language: German/English, [Open in study portal](#)

On-Site

**Content**

In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.

**Seminar Real-World Challenges in Data Science and Analytics (Master)**2513315, WS 24/25, 3 SWS, Language: German/English, [Open in study portal](#)

On-Site

**Content**

In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.

T

**8.226 Course: Seminar in Mathematics (Bachelor) [T-MATH-102265]**

**Responsible:** Prof. Dr. Günter Last  
Dr. Franz Nestmann  
PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-WIWI-101816 - Seminar Module](#)

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

T










## 8.227 Course: Seminar in Operations Research (Bachelor) [T-WIWI-103488]





**Responsible:** Prof. Dr. Stefan Nickel  
 Prof. Dr. Steffen Rebennack  
 Prof. Dr. Oliver Stein

**Organisation:** KIT Department of Economics and Management

**Part of:** M-WIWI-101816 - Seminar Module

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
ST 2024	2500028	Seminar: Modern OR and Innovative Logistics	2 SWS	Seminar / 	Nickel, Mitarbeiter, Pomes
ST 2024	2550131	Seminar on Methodical Foundations of Operations Research (B)	2 SWS	Seminar / 	Stein, Beck, Schwarze
ST 2024	2550132	Seminar on Mathematical Optimization (MA)	2 SWS	Seminar / 	Stein, Beck, Schwarze
ST 2024	2550461	Seminar: Trending Topics in Machine Learning and Optimization (Bachelor)	2 SWS	Seminar / 	Rebennack, Warwicker
ST 2024	2550472	Seminar: Energy and Power Systems Optimization (Bachelor)	2 SWS	Seminar / 	Rebennack, Warwicker
WT 24/25	2550131	Seminar on Methodical Foundations of Operations Research (B)	2 SWS	Seminar / 	Stein, Beck, Schwarze
WT 24/25	2550461	Seminar on Trending Topics in Optimization and Machine Learning (Bachelor)	2 SWS	Seminar / 	Rebennack, Warwicker
WT 24/25	2550472	Seminar on Energy and Power Systems Optimization (Bachelor)	2 SWS	Seminar / 	Rebennack, Warwicker
WT 24/25	2550491	Seminar: Modern OR and Innovative Logistics	2 SWS	Seminar / 	Nickel, Mitarbeiter
Exams					
ST 2024	7900026	Seminar Modern OR and Innovative Logistics			Nickel
ST 2024	7900200_SS2024	Seminar in Operations Research A (Master)			Stein
ST 2024	7900201_SS2024	Seminar in Operations Research (Bachelor)			Stein
ST 2024	7900317	Digitalization in the Steel Industry			Nickel
ST 2024	7900347	Seminar on Power Systems Optimization (Bachelor)			Rebennack
WT 24/25	7900342	Seminar Modern OR and Innovative Logistics			Nickel

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

### Prerequisites

None.

### Recommendation

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

**Annotation**

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

Below you will find excerpts from events related to this course:

**Seminar: Modern OR and Innovative Logistics**

2500028, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)  
Blended (On-Site/Online)

**Content**

The seminar aims at the presentation, critical evaluation and exemplary discussion of recent questions in discrete optimization. The focus lies on optimization models and algorithms, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management). The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic. Regarding the seminar presentations, the students will be familiarized with basic presentational and rhetoric skills.

**Organizational issues**

Anmeldung erfolgt über das Wiwi-Portal. Nähere Informationen hierzu finden Sie hier zu einem späteren Zeitpunkt.

**Literature**

Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

**Seminar on Methodical Foundations of Operations Research (B)**

2550131, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)  
On-Site

**Content**

The seminar aims at describing, evaluating, and discussing recent as well as classical topics in continuous optimization. The focus is on the treatment of optimization models and algorithms, also with respect to their practical application.

Bachelor student are introduced to the style of scientific work. By focused treatment of a scientific topic they deal with the basics of scientific investigation and reasoning.

For further development of a scientific work style, master students are particularly expected to critically question the seminar topics.

With regard to the oral presentations the students become acquainted with presentation techniques and basics of scientific reasoning. Also rethoric abilities may be improved.

**Remarks:**

Attendance at all oral presentations is compulsory.

Preferably at least one module offered by the Institute of Operations Research should have been chosen before attending this seminar.

**Assessment:**

The assessment is composed of a 15-20 page paper as well as a 40-60 minute oral presentation according to §4(2), 3 of the examination regulation. The grade is composed of the equally weighted assessments of the paper and the oral presentation.

The seminar is appropriate for bachelor as well as for master students. Their differentiation results from different assessment criteria for the seminar paper and the oral presentation.

**Workload:**

The total workload for this course is approximately 90 hours. For further information see German version.

**Literature**

Die Literatur und die relevanten Quellen werden gegen Ende des vorausgehenden Semesters im Wiwi-Portal und in einer Seminarvorbesprechung bekannt gegeben.

References and relevant sources are announced at the end of the preceding semester in the Wiwi-Portal and in a preparatory meeting.

**Seminar on Methodical Foundations of Operations Research (B)**

2550131, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)  
On-Site

**Content**

The seminar aims at describing, evaluating, and discussing recent as well as classical topics in continuous optimization. The focus is on the treatment of optimization models and algorithms, also with respect to their practical application.

Bachelor students are introduced to the style of scientific work. By focused treatment of a scientific topic they deal with the basics of scientific investigation and reasoning.

For further development of a scientific work style, master students are particularly expected to critically question the seminar topics.

With regard to the oral presentations the students become acquainted with presentation techniques and basics of scientific reasoning. Also rhetoric abilities may be improved.

**Remarks:**

Attendance at all oral presentations is compulsory.

Preferably at least one module offered by the Institute of Operations Research should have been chosen before attending this seminar.

**Assessment:**

The assessment is composed of a 15-20 page paper as well as a 40-60 minute oral presentation according to §4(2), 3 of the examination regulation. The grade is composed of the equally weighted assessments of the paper and the oral presentation.

The seminar is appropriate for bachelor as well as for master students. Their differentiation results from different assessment criteria for the seminar paper and the oral presentation.

**Workload:**

The total workload for this course is approximately 90 hours. For further information see German version.

**Literature**

Die Literatur und die relevanten Quellen werden gegen Ende des vorausgehenden Semesters im Wiwi-Portal und in einer Seminarvorbesprechung bekannt gegeben.

References and relevant sources are announced at the end of the preceding semester in the Wiwi-Portal and in a preparatory meeting.

**Seminar: Modern OR and Innovative Logistics**

2550491, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)  
Blended (On-Site/Online)**

**Content**

The seminar aims at the presentation, critical evaluation and exemplary discussion of recent questions in discrete optimization. The focus lies on optimization models and algorithms, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management). The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic. Regarding the seminar presentations, the students will be familiarized with basic presentational and rhetoric skills.

**Organizational issues**

**Anmeldezeitraum:** 11.09.24 bis 30.09.24 im Wiwi Portal

**Literature**

Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.



**8.228 Course: Seminar in Statistics (Bachelor) [T-WIWI-103489]**

**Responsible:** Prof. Dr. Oliver Grothe  
Prof. Dr. Melanie Schienle

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-101816 - Seminar Module](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
ST 2024	2500004	<a href="#">Predictive Data Analytics - An Introduction to Statistical Machine Learning</a>	2 SWS	Seminar /	Schienle, Lerch
ST 2024	2521310	<a href="#">Advanced Topics in Econometrics</a>	2 SWS	Seminar	Schienle, Krüger, Buse, Rüter, Bracher
ST 2024	2550560	<a href="#">Spezielle Themen zu Statistik, Datenanalyse und maschinellem Lernen</a>	2 SWS	Seminar /	Grothe, Kaplan, Liu, Rieger
WT 24/25	25000111	<a href="#">Statistics and Epidemics</a>		Seminar /	Bracher
WT 24/25	2500018		2 SWS	Seminar /	Grothe, Kaplan, Liu
WT 24/25	2500047	<a href="#">Advanced Topics in Econometrics, Statistics and Data Science</a>	2 SWS	Seminar	Schienle, Krüger, Buse, Rüter, Bracher
WT 24/25	2521310	<a href="#">Topics in Econometrics</a>	2 SWS	Seminar	Schienle, Krüger, Rüter
Exams					
ST 2024	7900004	<a href="#">Predictive Data Analytics - An Introduction to Statistical Machine Learning</a>			Lerch
ST 2024	7900150	<a href="#">Advanced Topics in Econometrics, Seminar in Statistics A (Master)</a>			Schienle, Krüger
ST 2024	7900355	<a href="#">Seminar in Statistics (Bachelor)</a>			Grothe

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

**Prerequisites**

None.

**Recommendation**

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

**Annotation**

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

Below you will find excerpts from events related to this course:

**Predictive Data Analytics - An Introduction to Statistical Machine Learning**

2500004, SS 2024, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)  
On-Site

**Organizational issues**

Blockveranstaltung, Termine werden bekannt gegeben

**Advanced Topics in Econometrics**

2521310, SS 2024, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**Organizational issues**

Blockveranstaltung, Termine werden bekannt gegeben

**Statistics and Epidemics**

25000111, WS 24/25, SWS, Language: English, [Open in study portal](#)

Seminar (S)  
On-Site**Content****Motivation**

Infectious disease epidemiology gives rise to a large variety of real-time data streams. During the COVID-19 pandemic, the interpretation and statistical analysis of these data has proven crucial, but also highly challenging. In this seminar, students will get to know central concepts of infectious disease surveillance and modelling from a statistical perspective. Following an overview of various aspects in the form of blocked lectures, students will choose a more specific topic for their seminar thesis.

**Learning Goals**

Students develop an understanding of central modeling tasks and methods, including

- estimation of reproductive numbers
- compartment models of disease spread
- nowcasting and short-term forecasting of disease spread
- detection of outbreaks
- diagnostic testing

Moreover, they get to know various data types commonly used in the analysis of disease spread.

**Logistics**

The project seminar is worth 4.5 credit points (Leistungspunkte). There will be three blocked lectures (approx. 135 minutes each) in the beginning of the lecture period. For the various topics covered, subjects for seminar theses will be proposed (and students are allowed to propose their own topics). Towards the end of the semester, students present their progress on the chosen topics to the group. Grades will be based on this presentation (25%) and the final report (75%).

**Organizational issues****Prerequisites**

Students should have a very good working knowledge of statistics, including proficiency in a programming language for applied data analysis. The lecture VWL3 Introduction to Econometrics is a prerequisite for the project seminar. Most available software in the field is in R, but in principle Python can be used as well. Advanced knowledge of biology, medicine or epidemiology is not required.

**Application Procedure**

Please submit a transcript of records as well as a short letter of motivation (roughly 200 words) via WIWI-Portal: <https://portal.wiwi.kit.edu/ys/8223>

Application time frame: July 20th, 2024 to September, 30th, 2024.

**Advanced Topics in Econometrics, Statistics and Data Science**

2500047, WS 24/25, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**Organizational issues**

Blockveranstaltung, Termine werden bekannt gegeben

**Topics in Econometrics**

2521310, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)****Organizational issues**

Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben

T


## 8.229 Course: Seminar Production Technology [T-MACH-109062]

**Responsible:** Prof. Dr.-Ing. Jürgen Fleischer  
Prof. Dr.-Ing. Gisela Lanza  
Prof. Dr.-Ing. Volker Schulze

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-WIWI-101816 - Seminar Module](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
ST 2024	2149665	<a href="#">Seminar Production Technology</a>	1 SWS	Seminar / 	Fleischer, Lanza, Schulze, Zanger
Exams					
ST 2024	76-T-MACH-109062	<a href="#">Seminar Production Technology</a>			Fleischer, Lanza, Schulze, Zanger
WT 24/25	76-T-MACH-109062	<a href="#">Seminar Production Technology</a>			Fleischer, Lanza, Schulze

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

### Prerequisites

none

### Annotation

The specific topics are published on the homepage of the wbk Institute of Production Science.

Below you will find excerpts from events related to this course:

V

### Seminar Production Technology

2149665, SS 2024, 1 SWS, Language: German, [Open in study portal](#)

Seminar (S)  
Blended (On-Site/Online)

**Content**

In course of the seminar Production Technology current issues of the wbk main fields of research "Manufacturing and Materials Technology", "Machines, Equipment and Process Automation" as well as "Production Systems" are discussed.

The specific topics are published on the homepage of the wbk Institute of Production Science.

**Learning Outcomes:**

The students ...

- are in a position to independently handle current, research-based tasks according to scientific criteria.
- are able to research, analyze, abstract and critically review the information.
- can draw own conclusions using their interdisciplinary knowledge from the less structured information and selectively develop current research results.
- can logically and systematically present the obtained results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.

**Workload:**

regular attendance: 10 hours

self-study: 80 hours

**Organizational issues**

siehe <http://www.wbk.kit.edu/seminare.php>

**8.230 Course: Seminar: Legal Studies I [T-INFO-101997]**

**Responsible:** N.N.  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-WIWI-101816 - Seminar Module](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
ST 2024	2400005	<a href="#">Governance, Risk &amp; Compliance</a>	2 SWS	Seminar /	Herzig, Siddiq
ST 2024	2400022	<a href="#">EU Digital Regulatory Framework</a>	2 SWS	Seminar /	Zufall
ST 2024	2400078	<a href="#">Intelligente Chatbots und Recht</a>	2 SWS	Seminar /	Raabe
ST 2024	2400170	<a href="#">Human and Fundamental Rights in the Digital Era: Current Challenges</a>	2 SWS	Seminar /	Friedl
ST 2024	2400171	<a href="#">Regulating AI: from ethics to law</a>	2 SWS	Seminar /	Gil Gasiola
ST 2024	2400194	<a href="#">(Generative) KI und Recht</a>	2 SWS	Seminar /	Boehm, Vettermann
ST 2024	2400204	<a href="#">„Vom Original zur Kopie und vom Analogen zum Digitalen“</a>	2 SWS	Seminar /	Dreier, Jehle
ST 2024	2400207	<a href="#">Rechtlicher Rahmen für die Europäische Datenökonomie</a>	2 SWS	Seminar /	Sattler
ST 2024	2400208	<a href="#">Rechtlicher Rahmen für Künstliche Intelligenz</a>	2 SWS	Seminar /	Sattler
ST 2024	24820	<a href="#">Current Issues in Patent Law</a>	2 SWS	Seminar /	Melullis
WT 24/25	2400060	<a href="#">Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection</a>	2 SWS	Seminar /	Reussner, Raabe, Werner, Müller-Quade
WT 24/25	2400184	<a href="#">EU Digital Regulatory Framework</a>	2 SWS	Seminar /	Zufall
WT 24/25	2400209	<a href="#">Rechtliche Herausforderungen für die Europäische Datenökonomie</a>	2 SWS	Seminar /	Sattler
WT 24/25	2400216	<a href="#">(Generative) KI und Recht</a>	2 SWS	Seminar /	Boehm, Vettermann
WT 24/25	2513214	<a href="#">Seminar Information security and Data protection (Bachelor)</a>	2 SWS	Seminar /	Volkamer, Raabe, Schiefer, Hennig, Sterz, Werner, Ullrich
Exams					
ST 2024	7500140	<a href="#">Seminar: Legal Studies I</a>			Raabe, Melullis, Boehm, Dreier
ST 2024	7500159	<a href="#">Seminar: Legal Studies I</a>			Zufall
WT 24/25	7500035	<a href="#">Seminar: Legal Studies II</a>			Zufall
WT 24/25	7500182	<a href="#">Seminar: Legal Studies II</a>			Boehm, Raabe, Sattler
WT 24/25	7500232	<a href="#">Seminar Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection</a>			Reussner
WT 24/25	7500249	<a href="#">Seminar: IT- Security Law</a>			Zufall

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Below you will find excerpts from events related to this course:

**EU Digital Regulatory Framework**

2400022, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**  
On-Site

**Content****Note:**

This class is mainly intended for Bachelor and Master students in Business Informatics and those with Law as a minor subject, but also open interested students from other disciplines.

This class aims to provide an overview on the legal instruments forming the EU digital regulatory framework. Following its Digital Single Market Strategy, the EU has set up a new strategic programme for a "Digital Decade". Existing regulations like the General Data Protection Regulation (GDPR), or the E-Commerce Directive, are being complemented by a variety of new instruments that aim to set binding rules on online markets, to regulate data flows in various ways, but also to pioneer a legal framework on AI. Prominent instruments include the new AI Act (proposal), the Digital Services Act (DSA) and Digital Markets Act (DMA), the Data Act, Data Governance Act, or Open Data Directive.

The class will provide an overview on the existing framework: Which regulations and directives are relevant? How do they apply and interact with each other in a broader context?

Another objective is to provide students with the ability to read these legal instruments: How to access regulatory instruments that often have more than 100 pages (without having to read every single sentence)? How to gain a comprehensive, high-level understanding of the instrument? How to identify parts relevant to a particular legal problem?

The class will start with an introduction into EU law and regulatory instruments in general. Concrete guidance on reading, analysing and working with legal instruments in English will be given. Based on these instructions, students will be assigned legal instruments to present in the final unit along with a two-pages report.

Grades will be assigned based on the quality of these presentations and the report, as well as participation in the discussion (presentation: 40 %, two-pages report: 40 %, discussion: 20 %).

**Organizational issues**

**Anmeldungen für das Seminar bitte NUR! über das WiWi-Portal!**

**\*Für die Prüfung bitte NUR über CAS (Campus-Portal) anmelden!**

\*Erläuterung: nach der für die Teilnahme am Seminar verbindlichen Teilnahme an der Einführungsveranstaltung bitte Anmeldung über das Campus-System (notwendig für die Erfassung der Note der Seminararbeit).

Termine im SoSe 2024:

Mittwoch, den 8. Mai 2024, 16-19h (Kick-off)

Dienstag, den 23. Juli 2024, 12-18h (Presentations).

Raum:

jeweils im Seminarraum Nr. 313, Geb. 07.08.

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English:

Please register for the seminar ONLY via the WiWi-Portal!

\*Please register for the exam ONLY via CAS (Campus-Portal)!

\*Explanation: after attending the introductory event, which is mandatory for participation in the seminar, please register via Campus System (necessary for recording the grade of the seminar papers).

Dates in summer term 2024:

Wednesday, 8 May 2024, 16-19h (kick-off)

Tuesday, 23 July 2024, 12-18h (presentations).

Room:

In seminar room no. 313, building 07.08.



## Human and Fundamental Rights in the Digital Era: Current Challenges

2400170, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)  
On-Site

**Content**

The seminar introduces students to the various fundamental and human rights documents relevant to Germany. It teaches students their basic content and familiarizes them with classic patterns of argumentation regarding the interpretation and application of fundamental rights. The seminar provides an overview of the relevance of human and fundamental rights for the development and use of new (digital) technologies. Students will be enabled to reflect on the human rights-implications of new technologies and to conceive own legal answers. One thematic focus will be on the (human rights) analysis and evaluation of new AI technologies. Fundamental and human rights issues in this area, which will be presented to the students or which they will explore themselves, include: Are AI developers allowed to use personal data from the internet for the development of AI systems and, if so, under what conditions? How do concepts of discrimination differ between computer scientists and lawyers? How should the authorizations of real-time biometric surveillance covered by the European AI Act be assessed in terms of fundamental rights? Do human rights protect artists from the unauthorized exploitation of their works for new "generative AI" systems? Students will also be free to explore other intersections between human rights and technology, such as new questions in data protection law, the use of new technologies by police, law enforcement and migration agencies or the fundamental rights obligations of large social media platforms such as Facebook or Twitter. The seminar's contents will partly be taught in a one-day seminar and will partly be explored by the students themselves in supervised term papers.

**Organizational issues**

**Anmeldungen für das Pro-Seminar bitte NUR! über das WiWi-Portal!**

**Nach** der für die Teilnahme am Seminar verbindlichen Teilnahme an der **Einführungsveranstaltung bitte Anmeldung über das Campus-System** (notwendig für die Erfassung der Note der Seminararbeit).

**Blockseminar im SoSe 2024 (2 Termine):**

1. Termin:

Freitag, 26. April 2024, 09:00 - 17:30 Uhr.

Ort: [20.30 Seminarraum -1.008 \(UG\)](#)

und

Freitag, 19. Juli 2024

jeweils von 09:00 - 17:30 Uhr (Stand per 3.1.2024)

**Raum:**

Geb. 50.28, Seminarraum 1 (Nebengebäude vom InformatiKOM)

<https://www.kit.edu/campusplan/>

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**English:**

(Please register for the seminar ONLY via the WiWi-Portal!

After attending the introductory event, which is mandatory for participation in the seminar, please register via the campus system (necessary for recording the grade of the seminar paper).

**Block seminar in summer term 2024 (2 dates):**

Friday, 26 April 2024

and

Friday, 19 July 2024

probably from 09:00 - 17:30 in each case (as of 3 January 2024)

**Room:**

Building 50.28, seminar room 1 (outbuilding of InformatiKOM)

<https://www.kit.edu/campusplan/>

**Regulating AI: from ethics to law**

2400171, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)  
On-Site**



**Content****Credit points = ECTS**

3 ECTS

**Language:**

English

**Competency Goals:**

Students comprehend the role of technology regulation.

They are able to identify different types of regulation and their impact on different stakeholders.

They know the main aspects of the regulation of AI systems.

They understand the foundations of the AI Act of the EU.

They know the content of AI principles and are able to assess their implementation in specific projects.

**Content:**

This seminar will provide an overview of the regulation of technologies and in particular the regulation of AI systems. After an introduction to forms of regulation, students will explore the different regulatory instruments from the perspective of the consolidated principles of AI: fairness, transparency, privacy, security and accountability. This will allow students to discuss how the principles and rules governing AI can be implemented in concrete cases. The seminar will cover the following topics:

- Introduction to technology regulation
- Objectives of regulation
- Types of regulation
- Challenges in regulating new / disruptive technologies
- Specific challenges in regulating AI
- Fragmented/vertical regulation of AI
- AI Act
- AI principles: fairness, transparency, privacy, security, and accountability
- The role of principles in regulating AI
  - Dealing with principles when developing and implementing AI systems

**Competency certificate:**

The assessment of this course is carried out by the following aspects, which will be considered in the grading (§ 4 Abs. 2 Nr. 3 SPO): term paper (approx. 5 pages), presentation (approx. 20 min.) and discussion.

The grading scale will be announced in the course. Students may redraw from the examination during the first two weeks after the topic has been communicated.

**Organizational issues**

**Anmeldungen für das Seminar bitte NUR! über das WiWi-Portal!**

**\*Für die Prüfung bitte NUR über CAS (Campus-Portal) anmelden!**

\*Erläuterung

Nach der für die Teilnahme am Seminar verbindlichen Teilnahme an der Einführungsveranstaltung bitte Anmeldung über das Campus-System (notwendig für die Erfassung der Note der Seminararbeit).

**Blockseminar im SoSe 2024 (2 Termine):**

Termine und Uhrzeit:

Mi, 17.04.2024, 14:00-17:00;

Mi, 17.07.2024, 12:00-18:00.

Raum: jeweils im Seminarraum Nr. 313 (Geb. 07.08)

**English:**

Please register for the seminar ONLY via the WiWi-Portal!

\*Please register for the exam ONLY via CAS (Campus-Portal)!

\*Explanation

After attending the introductory event, which is mandatory for participation in the seminar, please register via the campus system (necessary for recording the grade of the seminar paper).

**Block seminar in summer term 2024 (2 dates):**

Dates and time:

Wed, 17/04/2024, 14:00-17:00;

Wed, 17/07/2024, 12:00-18:00.

Room:each time in seminar room no. 313 (building 07.08)

**EU Digital Regulatory Framework**

2400184, WS 24/25, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)  
On-Site**

**Content**

This class aims to provide an overview on the legal instruments forming the EU digital regulatory framework. Following its Digital Single Market Strategy, the EU has set up a new strategic programme for a "Digital Decade". Existing regulations like the General Data Protection Regulation (GDPR), or the E-Commerce Directive, are being complemented by a variety of new instruments that aim to set binding rules on online markets, to regulate data flows in various ways, but also to pioneer a legal framework on AI. Prominent instruments include the new AI Act (proposal), the Digital Services Act (DSA) and Digital Markets Act (DMA), the Data Act, Data Governance Act, or Open Data Directive.

The class will provide an overview on the existing framework: Which regulations and directives are relevant? How do they apply and interact with each other in a broader context?

Another objective is to provide students with the ability to read these legal instruments: How to access regulatory instruments that often have more than 100 pages (without having to read every single sentence)? How to gain a comprehensive, high-level understanding of the instrument? How to identify parts relevant to a particular legal problem?

The class will start with an introduction into EU law and regulatory instruments in general. Concrete guidance on reading, analysing and working with legal instruments in English will be given. Based on these instructions, students will be assigned legal instruments to present in the final unit along with a two-pages report.

Grades will be assigned based on the quality of these presentations and the report, as well as participation in the discussion (presentation: 40 %, two-pages report: 40 %, discussion: 20 %).

**Organizational issues**

**WS 2024/25**

**Hierbei handelt es sich NICHT um eine Pro-Seminar, sondern um ein Seminar.**

**Anmeldungen für das Seminar bitte NUR! über das WiWi-Portal!**

**\*Für die Prüfung bitte NUR über CAS (Campus-Portal) anmelden!**

\*Erläuterung: nach der für die Teilnahme am Seminar verbindlichen Teilnahme an der Einführungsveranstaltung bitte Anmeldung über das Campus-System (notwendig für die Erfassung der Note der Seminararbeit).

**8.231 Course: Signals and Systems [T-ETIT-112860]**

**Responsible:** Dr.-Ing. Mathias Kluwe  
Prof. Dr.-Ing. Sander Wahls

**Organisation:** KIT Department of Electrical Engineering and Information Technology

**Part of:** [M-ETIT-106372 - Signals and Systems](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	7	Grade to a third	Each winter term	1 terms	1

Events					
WT 24/25	2302109	<a href="#">Signals and Systems</a>	3 SWS	Lecture /	Wahls, Kluwe
WT 24/25	2302111	<a href="#">Signals and Systems (Tutorial to 2302109)</a>	2 SWS	Practice /	Wahls, Leven, Illerhaus
Exams					
WT 24/25	7302109	<a href="#">Signals and Systems</a>			Wahls

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment of success takes place in the form of a written examination lasting 180 minutes. The module grade is the grade of the written examination.

**Prerequisites**

none





T

## 8.232 Course: Signals and Systems - Workshop [T-ETIT-112861]

**Responsible:** Prof. Dr.-Ing. Sander Wahls**Organisation:** KIT Department of Electrical Engineering and Information Technology**Part of:** [M-ETIT-106372 - Signals and Systems](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Completed coursework	2	pass/fail	Each summer term	1 terms	2

Events					
ST 2024	2302905	<a href="#">Signals and Systems - Workshop</a>	1 SWS	Practical course / 	Wahls
Exams					
ST 2024	7302314	<a href="#">Signals and Systems - Workshop</a>			Wahls

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Prerequisites**

none

T

## 8.233 Course: Simulation of Coupled Systems [T-MACH-105172]

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101265 - Vehicle Development](#)  
[M-MACH-101267 - Mobile Machines](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each summer term	2

Events					
ST 2024	2114095	<a href="#">Simulation of Coupled Systems</a>	2 SWS	Lecture / 🗣️	Geimer, Breitfuß
Exams					
ST 2024	76T-MACH-105172	<a href="#">Simulation of Coupled Systems</a>			Geimer
WT 24/25	76T-MACH-105172	<a href="#">Simulation of Coupled Systems</a>			Geimer

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 🗣️ On-Site, ✖ Canceled

### Competence Certificate

The assessment consists of an oral exam (20 min) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at very ordinary examination date.

A registration is mandatory, the details will be announced on the webpages of the *Institute of Vehicle System Technology / Institute of Mobile Machines*. In case of too many applications, attendance will be granted based on pre-qualification.

### Prerequisites

Required for the participation in the examination is the preparation of a report during the semester. The partial service with the code T-MACH-108888 must have been passed.

### Recommendation

- Knowledge of ProE (ideally in actual version)
- Basic knowledge of Matlab/Simulink
- Basic knowledge of dynamics of machines
- Basic knowledge of hydraulics

### Annotation

After completion of course, students are able to:

- build a coupled simulation
- parametrize models
- perform simulations
- conduct troubleshooting
- check results for plausibility

The number of participants is limited.

### Content:

- Basics of multi-body and hydraulics simulation programs
- Possibilities of coupled simulations
- Modelling and Simulation of Mobile Machines using a wheel loader
- Documentation of the result in a short report

### Literature:

Software guide books (PDFs)

Information about wheel-type loader specifications

Below you will find excerpts from events related to this course:



## Simulation of Coupled Systems

2114095, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

- Knowledge of the basics of multi-body and hydraulic simulation programs
- Possibilities of coupled simulations
- Development of a simulation model by using the example of a wheel loader
- Documentation of the result in a short report

It is recommended to have:

- Knowledge of ProE (ideally in current version)
- Basic knowledge of Matlab/Simulink
- Basic knowledge of dynamics of machines
- Basic knowledge of hydraulics
  
- regular attendance: 21 hours
- total self-study: 92 hours

### Literature

#### Weiterführende Literatur:

- Diverse Handbücher zu den Softwaretools in PDF-Form
- Informationen zum verwendeten Radlader

T

**8.234 Course: Simulation of Coupled Systems - Advance [T-MACH-108888]**

**Responsible:** Prof. Dr.-Ing. Marcus Geimer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101265 - Vehicle Development](#)  
[M-MACH-101267 - Mobile Machines](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each summer term	1

Exams			
ST 2024	76-T-MACH-108888	<a href="#">Simulation of Coupled Systems - Advance</a>	Geimer

**Competence Certificate**

Preparation of semester report

**Prerequisites**

none

**8.235 Course: Social Science A (WiWi) [T-GEISTSOZ-109048]****Responsible:** Prof. Dr. Gerd Nollmann**Organisation:** KIT Department of Humanities and Social Sciences**Part of:** [M-GEISTSOZ-101167 - Sociology/Empirical Social Research](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each winter term	1

Events					
ST 2024	5000048	<a href="#">Socio-scientific Theories of Technology Assessment</a>	2 SWS	Proseminar (/ ●)	Lösch
ST 2024	5011013	<a href="#">When and why does polarization of opinion arise?</a>	2 SWS	Seminar / ☼	Mäs
ST 2024	5011019	<a href="#">The future of democracy</a>	2 SWS	Seminar / ●	Mäs
WT 24/25	5011011	<a href="#">Artificial intelligence in the research process</a>	2 SWS	Seminar / ☼	Banisch
WT 24/25	5011014	<a href="#">Advanced module: Technology and Future: Theories of prospective knowledge</a>	2 SWS	Seminar / ●	Lösch
Exams					
ST 2024	7400021	<a href="#">Wann und warum entsteht Meinungspolarisierung?</a>			Mäs
ST 2024	7400379	<a href="#">Social Science A</a>			Nollmann
ST 2024	7400454	<a href="#">Social Science A (WiWi)</a>			Nollmann
ST 2024	7400724	<a href="#">Die Zukunft der Demokratie</a>			Mäs
WT 24/25	7400041	<a href="#">Social Science A (WiWi)</a>			Nollmann

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Below you will find excerpts from events related to this course:

**When and why does polarization of opinion arise?**5011013, SS 2024, 2 SWS, Language: German, [Open in study portal](#)**Seminar (S)**  
**Blended (On-Site/Online)****Content**

Numerous western countries experience rising opinion polarization. In particular in the US, it has been warned, growing opinion differences dominate public debate and put at risk democratic decision making. This seminar is concerned with the question why opinion distributions polarize and how too strong polarization can be overcome. To this end, central formal models of opinion dynamics are introduced and analyzed. Students are introduced to the method of agent-based modeling, using the software NetLogo. After the course, students will be able to implement, analyze, and understand these models. In an additional step, we will explore models' predictions about possible intervention strategies targeted at decreasing polarization.

**The future of democracy**5011019, SS 2024, 2 SWS, Language: German, [Open in study portal](#)**Seminar (S)**  
**On-Site****Content**

Democracy is under threat. A significant and increasingly vocal segment of many Western societies feels disenfranchised by democratic institutions. Populist movements with overtly anti-democratic agendas are gaining traction and achieving electoral success. In this seminar, we will delve into strategies for addressing these challenges. What measures can be taken to address the root causes of populist appeal? Can regulating online social platforms be effective? How are efforts underway to bolster civil society, and what novel democratic mechanisms are emerging to enhance citizen engagement in legislative processes? What role can citizens' councils play, and what opportunities do digital deliberation platforms present? At the heart of our discussion lies the question: What research is necessary to conceive, evaluate, and refine new approaches to democracy? How can such research be conducted amidst the mounting pressures on democracy?



**Organizational issues**

Teilnehmende halten einen Kurzvortrag und erstellen einen Seminararbeit.

**Artificial intelligence in the research process**

5011011, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)  
Blended (On-Site/Online)

**Content**

ChatGPT und andere Large Language Models (LLMs) transformieren unsere Gesellschaft auf vielen Ebenen. Auch Studium und Wissenschaft stehen vor tiefgreifenden Veränderungen. Im Seminar „Künstliche Intelligenz im Forschungsprozess“ nähern wir uns diesen neuen Technologien und erproben, wie sie sinnvoll eingesetzt werden können, um aktuelle Forschungsfragen zu adressieren. Wir orientieren uns dabei an den Methoden und Fragestellungen der Computer-gestützten Sozialwissenschaft (Computational Social Science) mit besonderem Fokus auf die Extraktion komplexer Bedeutungsmuster (z.B. Meinungen, Argumente, Narrative, etc.). Das Seminar ist als Blockseminar mit zwei Blöcken konzipiert (voraussichtlich Januar and März). Gemeinsam erarbeiten wir Themen für Miniprojekte, die zwischen den beiden Blöcken von den Studierenden bearbeitet werden. Im Vorfeld wird es eine online-Sitzung geben.

**Organizational issues**

Diese Veranstaltung wird als Blockseminar angeboten.

06.03.2025; 10-18 Uhr

14.03.2025; 10-17 Uhr

15.03.2025; 10-17 Uhr

**T 8.236 Course: Social Science B (WiWi) [T-GEISTSOZ-109049]**

**Responsible:** Prof. Dr. Gerd Nollmann  
**Organisation:** KIT Department of Humanities and Social Sciences  
**Part of:** [M-GEISTSOZ-101167 - Sociology/Empirical Social Research](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each winter term	1

Events					
ST 2024	5000048	<a href="#">Socio-scientific Theories of Technology Assessment</a>	2 SWS	Proseminar (/ ●)	Lösch
ST 2024	5011013	<a href="#">When and why does polarization of opinion arise?</a>	2 SWS	Seminar / ☼	Mäs
WT 24/25	5011011	<a href="#">Artificial intelligence in the research process</a>	2 SWS	Seminar / ☼	Banisch
WT 24/25	5011014	<a href="#">Advanced module:Technology and Future: Theories of prospective knowledge</a>	2 SWS	Seminar / ●	Lösch
Exams					
ST 2024	7400455	<a href="#">Social Science B (WiWi)</a>			Nollmann
WT 24/25	7400046	<a href="#">Social Science B (WiWi)</a>			Nollmann

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Below you will find excerpts from events related to this course:

**V When and why does polarization of opinion arise?** Seminar (S)  
 5011013, SS 2024, 2 SWS, Language: German, [Open in study portal](#)  
**Blended (On-Site/Online)**

**Content**

Numerous western countries experience rising opinion polarization. In particular in the US, it has been warned, growing opinion differences dominate public debate and put at risk democratic decision making. This seminar is concerned with the question why opinion distributions polarize and how too strong polarization can be overcome. To this end, central formal models of opinion dynamics are introduced and analyzed. Students are introduced to the method of agent-based modeling, using the software NetLogo. After the course, students will be able to implement, analyze, and understand these models. In an additional step, we will explore models' predictions about possible intervention strategies targeted at decreasing polarization.

**V Artificial intelligence in the research process** Seminar (S)  
 5011011, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)  
**Blended (On-Site/Online)**

**Content**

ChatGPT und andere Large Language Models (LLMs) transformieren unsere Gesellschaft auf vielen Ebenen. Auch Studium und Wissenschaft stehen vor tiefgreifenden Veränderungen. Im Seminar „Künstliche Intelligenz im Forschungsprozess“ nähern wir uns diesen neuen Technologien und erproben, wie sie sinnvoll eingesetzt werden können, um aktuelle Forschungsfragen zu adressieren. Wir orientieren uns dabei an den Methoden und Fragestellungen der Computer-gestützten Sozialwissenschaft (Computational Social Science) mit besonderem Fokus auf die Extraktion komplexer Bedeutungsmuster (z.B. Meinungen, Argumente, Narrative, etc.). Das Seminar ist als Blockseminar mit zwei Blöcken konzipiert (voraussichtlich Januar and März). Gemeinsam erarbeiten wir Themen für Miniprojekte, die zwischen den beiden Blöcken von den Studierenden bearbeitet werden. Im Vorfeld wird es eine online-Sitzung geben.

**Organizational issues**

Diese Veranstaltung wird als Blockseminar angeboten.

06.03.2025; 10-18 Uhr

14.03.2025; 10-17 Uhr

15.03.2025; 10-17 Uhr

**8.237 Course: Special Topics in Information Systems [T-WIWI-109940]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101434 - eBusiness and Service Management](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	2

Exams			
ST 2024	00023	<a href="#">Special Topics: Electricity Multi-Market Bidding with Deep Reinforcement Learning</a>	Weinhardt
ST 2024	790000003	<a href="#">Special Topics: Deep Reinforcement Learning for Strategic Bidding in Energy Markets</a>	Weinhardt

**Competence Certificate**

The assessment of this course is in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class.

Please take into account that, beside the written documentation, also a practical component (such as a survey or an implementation of an application) is part of the course. Please examine the course description for the particular tasks.

The overall grade is composed as follows:

A total of 60 points can be achieved, of which

- A maximum of 30 points for the written documentation
- A maximum of 30 points for the practical component

In order to pass the success control, at least 15 points (written documentation / practical component) must be achieved.

**Prerequisites**

see below

**Recommendation**

None

**Annotation**

All the practical seminars offered at the chair of Prof. Dr. Weinhardt can be chosen in the Special Topics in Information Systems course. The current topics of the practical seminars are available at the following homepage: [www.iism.kit.edu/im/lehre](http://www.iism.kit.edu/im/lehre).

The Special Topics Information Systems is equivalent to the practical seminar, as it was only offered for the major in "Information Systems" so far. With this course students majoring in "Industrial Engineering and Management" and "Economics Engineering" also have the chance of getting practical experience and enhance their scientific capabilities.

The Special Topics Information Systems can be chosen instead of a regular lecture (see module description). Please take into account, that this course can only be accounted once per module.

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## 8.238 Course: Statistical Modeling of Generalized Regression Models [T-WIWI-103065]

**Responsible:** apl. Prof. Dr. Wolf-Dieter Heller  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101599 - Statistics and Econometrics](#)  
[M-WIWI-105414 - Statistics and Econometrics II](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2521350	<a href="#">Statistical Modeling of Generalized Regression Models</a>	2 SWS	Lecture	Heller
Exams					
WT 24/25	7900146 (WS23/24)	<a href="#">Statistical Modeling of generalized regression models</a>			Heller

### Competence Certificate

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation.

### Prerequisites

None

### Recommendation

Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics" [2520016]

Below you will find excerpts from events related to this course:

V

### Statistical Modeling of Generalized Regression Models

2521350, WS 24/25, 2 SWS, [Open in study portal](#)

Lecture (V)

### Content

#### Learning objectives:

The student has profound knowledge of generalized regression models.

#### Requirements:

Knowledge of the contents covered by the course *Economics III: Introduction in Econometrics* [2520016].

#### Workload:

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

T


## 8.239 Course: Statistics I [T-WIWI-102737]





**Responsible:** Prof. Dr. Oliver Grothe  
Prof. Dr. Melanie Schienle

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-100950 - Preliminary Exam](#)  
[M-WIWI-101432 - Introduction to Statistics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	1

Events					
ST 2024	2600008	<a href="#">Statistics I</a>	4 SWS	Lecture / 	Grothe
ST 2024	2600009	<a href="#">Tutorien zu Statistik I</a>		Tutorial (	Lerch, Becker, Grothe
Exams					
ST 2024	7900104	<a href="#">Statistics I</a>			Grothe, Lerch
WT 24/25	7900022	<a href="#">Statistics I</a>			Grothe, Lerch

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

Depending on further pandemic developments, the examination will be offered either as a 120-minute written examination (written examination according to SPO § 4 Abs. 2, Pkt. 1) or as an open-book examination (alternative exam assessment according to SPO § 4 Abs. 2, Pkt. 3).

**Prerequisites**

None

Below you will find excerpts from events related to this course:

V

**Statistics I**

2600008, SS 2024, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content****Learning objectives:**

Students understand and apply

- basic concepts of statistical data exploration as well as
- basic definitions and theorems of probability theory.

**Content:**

A. Descriptive Statistics: univariate und bivariate analysis

B. Probability Theory: probability space, conditional and product probabilities

C. Random variables: location and shape parameters, dependency measures, concrete distribution models

**Workload:**

Total workload for 5 CP: approx. 150 hours

Attendance: 60 hours

Preparation and follow-up: 90 hours

**Literature**

Skriptum: Kurzfassung Statistik I

**Weiterführende Literatur:**

Bamberg, G., Baur, F. und Krapp, M.: Statistik, 15. überarb. Auflage. Oldenbourg, München 2009, ISBN 978-3486590883.

Fahrmeir, L., Heumann, C., Künstler, R., Pigeot, I. und Tutz, G.: Statistik - Der Weg zur Datenanalyse, 8. Auflage. Springer Spektrum. Berlin 2016, ISBN 978-3-662-50371-3.

Mosler, K. und Schmid, F.: Beschreibende Statistik und Wirtschaftsstatistik, 4. akt. und verb. Auflage, Springer, Berlin 2009, ISBN 978-3642015564.

Mosler, K. und Schmid, F.: Wahrscheinlichkeitsrechnung und schließende Statistik, 4. verb. Aufl., Springer, Berlin 2011, ISBN 978-3642150098.

Stock, J.H. und Watson M.W.: Introduction to Econometrics, 3. Auflage, Prentice Hall 2014, ISBN 978-1292071312

Stocker, T.C. und Steinke I.: Statistik: Grundlagen und Methodik. De Gruyter Oldenbourg, Berlin 2016 ISBN-13: 978-3110353884.

**8.240 Course: Statistics II [T-WIWI-102738]**

**Responsible:** Prof. Dr. Oliver Grothe  
Prof. Dr. Melanie Schienle

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-101432 - Introduction to Statistics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	1

Events					
WT 24/25	2610020	<a href="#">Statistics II</a>	4 SWS	Lecture /	Schienle
Exams					
ST 2024	7900082	<a href="#">Statistics II</a>			Krüger, Lerch
WT 24/25	7900001	<a href="#">Statistics II</a>			Schienle, Lerch

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment consists of a written exam according to Section 4 (2), 1 of the examination regulation.

The exam takes place at the end of the lecture period or at the beginning of the recess period. The re-examination takes place in the following semester.

**Prerequisites**

None

**Recommendation**

It is recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2610020].

Below you will find excerpts from events related to this course:

**Statistics II**

2610020, WS 24/25, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content****Learning objectives:**

The student

- understands and applies the basic definitions and theorems of probability theory,
- transfers these theoretical foundations to problems in parametrical mathematical statistics.

**Content:**

D. Sampling and Estimation Theory: Sampling distributions, estimators, point and interval estimation

E. Test Theory: General Principles of Hypothesis Testing, Concrete 1- and 2-Sampling Tests

F. Regression analysis: Simple and multiple linear regression, statistical inference

**Requirements:**

It is recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2600020].

**Workload:**

Total workload: 150 hours (5.0 Credits).

Attendance: 30 hours

Preparation and follow-up: 90 hours



**Literature**

Skriptum: Kurzfassung Statistik II

**Weiterführende Literatur:**

Bamberg, G., Baur, F. und Krapp, M.: Statistik, 15. überarb. Auflage. Oldenbourg, München 2009, ISBN 978-3486590883.

Fahrmeir, L., Heumann, C., Künstler, R., Pigeot, I. und Tutz, G.: Statistik - Der Weg zur Datenanalyse, 8. Auflage. Springer Spektrum. Berlin 2016, ISBN 978-3-662-50371-3.

Mosler, K. und Schmid, F.: Beschreibende Statistik und Wirtschaftsstatistik, 4. akt. und verb. Auflage, Springer, Berlin 2009, ISBN 978-3642015564.

Mosler, K. und Schmid, F.: Wahrscheinlichkeitsrechnung und schließende Statistik, 4. verb. Aufl., Springer, Berlin 2011, ISBN 978-3642150098.

Stock, J.H. und Watson M.W.: Introduction to Econometrics, 3. Auflage, Prentice Hall 2014, ISBN 978-1292071312

Stocker, T.C. und Steinke I.: Statistik: Grundlagen und Methodik. De Gruyter Oldenbourg, Berlin 2016 ISBN-13: 978-3110353884.

**T** **8.241 Course: Strategic Decision-Making in Global Production Network Design: A Seminar on Optimization and Simulation [T-MACH-113372]**

**Responsible:** Martin Benfer  
 Prof. Dr.-Ing. Gisela Lanza

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106590 - Production Engineering](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each summer term	2

Events					
ST 2024	2150658	<a href="#">Strategic Decision-Making in Global Production Network Design: A Seminar on Optimization and Simulation</a>	2 SWS	Seminar /	Lanza, Benfer
Exams					
ST 2024	76-T-MACH-113372	<a href="#">Strategic Decision-Making in Global Production Network Design: A Seminar on Optimization and Simulation</a>			Lanza

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

The assessment takes the form of an examination with a different type of success check (in accordance with §4(2), 3 SPO). Here, the project work, the milestone-based presentation of the results in presentation form and a final presentation are included in the assessment

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-MACH-110991 - Global Production](#) must have been passed.

**Recommendation**

Participation in the following lectures:  
 Integrated Production Planning in the Age of Industry 4.0 [2150660]  
 Introduction to Operations Research I [2550040] + II [2530043]

Below you will find excerpts from events related to this course:

V

**Strategic Decision-Making in Global Production Network Design: A Seminar on Optimization and Simulation**

2150658, SS 2024, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)  
On-Site

**Content**

The lecture "Strategic Decision Making in the Design of Global Production Networks: A Seminar in Optimization and Simulation" offers students a comprehensive insight into the application of quantitative models from operations research in global production networks. The course places special emphasis on practical applications and allows students to deepen their skills through a real-world use case during the semester.

The classroom sessions serve to convey important basics and to introduce and present the practice-relevant cases. In the self-study phase, the topics covered are worked on in greater depth. The curriculum covers various phases. Optimization techniques for network design are covered first, followed by simulation methods for network management. Subsequently, open questions are dealt with, e.g. from the consideration of uncertainty, sustainability aspects or the search for the overall optimum in the production network.

The students are divided into small groups to work together on the questions. The methods taught in the course are implemented in python. In order to strengthen the students' presentation skills, regular presentations of interim results are planned. The progress made is supported by feedback and interaction with an internationally operating consulting firm.

The practical orientation of the course, combined with the application of quantitative models and the use of Python, enables students to prepare holistically for complex challenges in global production.

**Learning Outcomes:**

The Students are able to

1. **put concepts of global production into practice:**
  - Understand how global production networks can be implemented in real business scenarios.
  - Develop and implement strategies for adapting global production networks to specific business requirements.
2. **in-depth knowledge and use of optimization in global production:**
  - Develop an in-depth understanding of various optimization techniques in global production processes.
  - Apply optimization models to complex production networks and continuously improve them.
3. **approach to improving network configuration, site selection and transportation routes:**
  - Understand methods to evaluate and optimize production networks.
  - Effectively plan and improve site selection decisions and transportation routes.
4. **deepen knowledge and use of simulations in global production:**
  - Understand how simulations can be used as a tool to analyze and optimize global production processes.
  - Gain experience in the application of simulation techniques for modeling and analyzing production processes.
5. **approach to improving delivery reliability:**
  - Develop and implement strategies to improve delivery reliability.
  - Optimize processes that can affect delivery reliability.
6. **consider uncertainties, aspects of sustainability and multidimensionality:**
  - Recognize and manage uncertainties in global production environments.
  - Consider sustainability aspects and multidimensional challenges when making decisions in global production.
7. **linking results and models:**
  - Link models and analytical results to create holistic solutions to complex problems in global production.
  - Strengthen the ability to iteratively improve models based on real-world results.
8. **presentations to management:**
  - Present complex global manufacturing concepts to management in an understandable and persuasive manner.
  - Build confidence in the use of visual aids and effective communication techniques in front of management levels.

**Workload:**

regular attendance: ~ 30 hours

self-study: ~ 99 hours

**Organizational issues**

Aus organisatorischen Gründen ist die Teilnehmerzahl für die Lehrveranstaltung auf 20 Studierende begrenzt. Termine und Fristen zur Veranstaltung werden über die Homepage des wbk (<https://www.wbk.kit.edu/studium-und-lehre.php>) bekannt gegeben.

For organizational reasons the number of students is limited to 20. Dates and deadlines for the seminar will be announced via the homepage of wbk (<https://www.wbk.kit.edu/studium-und-lehre.php>).

**Literature**

Vorlesungsskript der Lehrveranstaltungen / Lecture notes of the courses:

Abele et al. (2008): Global Production [978-3-540-71652-5]

Domschke et al. (2015): Einführung in das Operations Research [Einführung in Operations Research]


Friedli et al. (2021): Global Manufacturing Management: From Excellent Plants Toward Network Optimization [978-3-030-72739-0]

T

## 8.242 Course: Strategic Management [T-WIWI-113090]

**Responsible:** Prof. Dr. Hagen Lindstädt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101425 - Strategy and Organization](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each summer term	1

Events					
ST 2024	2577900	<a href="#">Strategic Management</a>	2 SWS	Lecture / 	Lindstädt
Exams					
ST 2024	7900067	<a href="#">Strategic Management</a>			Lindstädt
WT 24/25	7900199	<a href="#">Strategic Management</a>			Lindstädt

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

The assessment consists of a written exam (60 min) taking place at the beginn of the recess period (according to §4 (2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

Below you will find excerpts from events related to this course:

V

**Strategic Management**

2577900, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

Students learn central concepts of strategic management along the ideal-typical strategy process. An overview of fundamental frameworks and models will be provided and an action-oriented integration performance will be achieved through the transfer of theory to practical issues.

Through intensive exposure to real-world case studies, students will be encouraged to learn and apply strategic measures in a targeted manner in the real business world. The course features an action-oriented approach and provides students with a realistic understanding of the possibilities and limitations of rational design approaches.

Content in Keywords:

- Corporate governance and strategic management: concepts, levels, process.
- Strategic analysis: internal and external analysis
- Competitive strategy: formulation, evaluation and selection of strategic action alternatives at business unit level
- Strategic interaction and strategic commitment
- Corporate strategy: diversification strategy, M&A and management of the corporate portfolio
- Implementation of strategies in companies

**Structure:**

Lectures in the course are available to students online as recordings, while class dates are reserved for active discussion of real-world case studies.

**Learning Objectives:**

Upon completion of the course, students will be able to,

- Prepare strategic decisions along the ideal strategic process in a practical setting,
- Identify sources of competitive advantage,
- Explain interrelationships of companies in competition,
- Evaluate the portfolio management of companies,
- To classify actions and decisions of companies strategically,
- Apply knowledge from theoretical frameworks to the analysis of real-life situations.

**Recommendations:**

None.

**Workload:**

Total workload for 3.5 credit hours: approximately 105 hours.

Attendance: 30 hours

Self-study: 75 hours

**Verification:**

Depending on further pandemic developments, the examination will be offered in the summer semester 2021 either as an open-book examination (examination performance of another kind according to SPO § 4 Abs. 2, Pkt. 3), or as a 60-minute written examination (written examination according to SPO § 4 Abs. 2, Pkt. 1).

It is expected that the exam will take place at the beginning of the semester's lecture-free period.

The examination is offered every semester and can be repeated at any regular examination date.

**Literature**

- Pidun, U.: *Corporate Strategy: Theory and Practice*. Springer-Gabler, Wiesbaden 2019.
- Lindstädt, H.; Hauser, R.: *Strategische Wirkungsbereiche des Unternehmens*. Gabler, Wiesbaden 2004.
- Grant, R.M.: *Contemporary Strategy Analysis, 10. Aufl., Wiley 2018*.

Die relevanten Auszüge und zusätzliche Quellen werden in der Veranstaltung bekannt gegeben.

T

**8.243 Course: Structural and Phase Analysis [T-MACH-102170]****Responsible:** Dr.-Ing. Susanne Wagner**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Exams			
ST 2024	76-T-MACH-102170	<a href="#">Structural and Phase Analysis</a>	Wagner
WT 24/25	76-T-MACH-102170	<a href="#">Structural and Phase Analysis</a>	Wagner, Hinterstein

**Competence Certificate**

Oral examination

**Prerequisites**

none

T

**8.244 Course: Supplement Applied Informatics [T-WIWI-110711]**

**Responsible:** Professorenschaft des Instituts AIFB  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each term	1

**Competence Certificate**

The assessment of this course is a written or (if necessary) oral examination.

Depending on the particular course associated with this placeholder a bonus on the examination grade is possible.

**Prerequisites**

None

**Annotation**

This course can be used in particular for the acceptance of external courses whose content is in the broader area of applied informatics, but is not equivalent to another course of this topic.

T


**8.245 Course: Sustainable Vehicle Drivetrains [T-MACH-111578]**





**Responsible:** Prof. Dr. Thomas Koch  
Dr.-Ing. Olaf Toedter

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2133132	<a href="#">Sustainable Vehicle Drivetrains</a>	2 SWS	Lecture / 	Toedter

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Competence Certificate**

oral exam (approx. 20 minutes)

**Prerequisites**

none

**Annotation**

Starting in winter term 25/26, the course consists of a lecture (2h / week) and a tutorial (1 h / week).

*Below you will find excerpts from events related to this course:*

V

**Sustainable Vehicle Drivetrains**

2133132, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

Sustainability  
Environmental balance  
Legislation  
Alternative fuels  
BEV  
Fuel cell  
Hybrid drives



T

## 8.246 Course: Systematic Materials Selection [T-MACH-100531]

**Responsible:** Dr.-Ing. Stefan Dietrich  
Prof. Dr.-Ing. Volker Schulze

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each summer term	5

Events					
ST 2024	2174576	<a href="#">Systematic Materials Selection</a>	3 SWS	Lecture /	Dietrich
ST 2024	2174577	<a href="#">Exercices in Systematic Materials Selection</a>	1 SWS	Practice /	Dietrich
Exams					
ST 2024	76-T-MACH-100531	<a href="#">Systematic Materials Selection</a>			Dietrich
WT 24/25	76-T-MACH-100531	<a href="#">Systematic Materials Selection</a>			Dietrich

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

#### Competence Certificate

The assessment is carried out as a written exam of 2 h.

#### Prerequisites

none

#### Recommendation

Basic knowledge in materials science, mechanics and mechanical design due to the lecture Materials Science I/II.

Below you will find excerpts from events related to this course:

V

#### Systematic Materials Selection

2174576, SS 2024, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

**Content**

Important aspects and criteria of materials selection are examined and guidelines for a systematic approach to materials selection are developed. The following topics are covered:

- Information and introduction
- Necessary basics of materials
- Selected methods / approaches of the material selection
- Examples for material indices and materials property charts
- Trade-off and shape factors
- Sandwich materials and composite materials
- High temperature alloys
- Regard of process influences
- Material selection for production lines
- Incorrect material selection and the resulting consequences
- Abstract and possibility to ask questions

**learning objectives:**

The students are able to select the best material for a given application. They are proficient in selecting materials on base of performance indices and materials selection charts. They can identify conflicting objectives and find sound compromises. They are aware of the potential and the limits of hybrid material concepts (composites, bimaternal, foams) and can determine whether following such a concept yields a useful benefit.

**requirements:**

WiIng SPO 2007 (B.Sc.)

The course Material Science I [21760] has to be completed beforehand.

WiIng (M.Sc.)

The course Material Science I [21760] has to be completed beforehand.

**workload:**

The workload for the lecture is 120 h per semester and consists of the presence during the lecture (30 h) as well as preparation and rework time at home (30 h) and preparation time for the oral exam (60 h).

**Literature**

Vorlesungsskriptum; Übungsblätter; Lehrbuch: M.F. Ashby, A. Wanner (Hrsg.), C. Fleck (Hrsg.);  
Materials Selection in Mechanical Design: Das Original mit Übersetzungshilfen  
Easy-Reading-Ausgabe, 3. Aufl., Spektrum Akademischer Verlag, 2006  
ISBN: 3-8274-1762-7

Lecture notes; Problem sheets; Textbook: M.F. Ashby, A. Wanner (Hrsg.), C. Fleck (Hrsg.);  
Materials Selection in Mechanical Design: Das Original mit Übersetzungshilfen  
Easy-Reading-Ausgabe, 3. Aufl., Spektrum Akademischer Verlag, 2006  
ISBN: 3-8274-1762-7

T


## 8.247 Course: Systems of Remote Sensing, Prerequisite [T-BGU-101637]




**Responsible:** Prof. Dr. Jan Cermak  
 Prof. Dr.-Ing. Stefan Hinz  
 Dr.-Ing. Uwe Weidner

**Organisation:** KIT Department of Civil Engineering, Geo and Environmental Sciences

**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1	pass/fail	Each summer term	1

Events					
ST 2024	6020242	<a href="#">Systems of Remote Sensing, Exercise</a>	1 SWS	Practice / 	Bork-Unkelbach
Exams					
ST 2024	8284101637	<a href="#">Systems of Remote Sensing, Prerequisite</a>			Andersen, Cermak

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

**T 8.248 Course: Tactical and Operational Supply Chain Management [T-WIWI-102714]**

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101413 - Applications of Operations Research](#)  
[M-WIWI-101421 - Supply Chain Management](#)  
[M-WIWI-103278 - Optimization under Uncertainty](#)

<b>Type</b> Written examination	<b>Credits</b> 4,5	<b>Grading scale</b> Grade to a third	<b>Recurrence</b> Each summer term	<b>Version</b> 3
------------------------------------	-----------------------	------------------------------------------	---------------------------------------	---------------------

Events					
ST 2024	2550486	<a href="#">Tactical and operational SCM</a>	3 SWS	Lecture /	Nickel
ST 2024	2550487	<a href="#">Übungen zu Taktisches und operatives SCM</a>	1.5 SWS	Practice /	Pomes, Linner, Hoffmann
Exams					
ST 2024	7900239	<a href="#">Tactical and Operational Supply Chain Management</a>			Nickel
WT 24/25	7900104	<a href="#">Tactical and Operational Supply Chain Management</a>			Nickel

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

**Competence Certificate**

Depending on further pandemic developments, the exam will be offered either as an open-book exam, or as a written exam (60 min).

The exam takes place in every semester.

Prerequisite for admission to examination is the successful completion of the online assessments.

**Prerequisites**

Prerequisite for admission to examination is the succesful completion of the online assessments.

**Recommendation**

None

**Annotation**

The lecture is held in every summer term. The planned lectures and courses for the next three years are announced online.

Below you will find excerpts from events related to this course:

V

**Tactical and operational SCM**

2550486, SS 2024, 3 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**  
**On-Site**

**Content**

The planning of material transport is an essential element of Supply Chain Management. By linking transport connections across different facilities, the material source (production plant) is connected with the material sink (customer). The general supply task can be formulated as follows (cf. Gudehus): For given material flows or shipments, choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints. The main goal of the inventory management is the optimal determination of order quantities in terms of minimization of fixed and variable costs subject to resource constraints, supply availability and service level requirements. Similarly, the problem of lot sizing in production considers the determination of the optimal amount of products to be produced in a time slot. The course includes an introduction to basic terms and definitions of Supply Chain Management and a presentation of fundamental quantitative planning models for distribution, vehicle routing, inventory management and lot sizing. Furthermore, case studies from practice will be discussed in detail.

Passing the online exercise is a prerequisite for admission to the exam.

**Literature****Weiterführende Literatur**

- Domschke: Logistik: Transporte, 5. Auflage, Oldenbourg, 2005
- Domschke: Logistik: Rundreisen und Touren, 4. Auflage, Oldenbourg, 1997
- Ghiani, Laporte, Musmanno: Introduction to Logistics Systems Planning and Control, Wiley, 2004
- Gudehus: Logistik, 3. Auflage, Springer, 2005
- Simchi-Levi, Kaminsky, Simchi-Levi: Designing and Managing the Supply Chain, 3rd edition, McGraw-Hill, 2008
- Silver, Pyke, Peterson: Inventory management and production planning and scheduling, 3rd edition, Wiley, 1998

## T

## 8.249 Course: Team Project Management and Technology [T-WIWI-110968]

**Responsible:** Prof. Dr. Martin Klarmann  
Prof. Dr. Alexander Mädche

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-105440 - Team Project Management and Technology](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	9	Grade to a third	Each term	1 terms	1

Events					
ST 2024	2514040	<a href="#">Teamprojekt Wirtschaft und Technologie - Critical Information Infrastructures</a>		Project (P / 📱)	Sunyaev, Dehling, Goram
ST 2024	2571176	<a href="#">Teamprojekt Wirtschaft und Technologie</a>		Project (P / 🔄)	Klarmann, Mädche
WT 24/25	2571176	<a href="#">Team Project Management and Technology</a>	6 SWS	Project (P / 🔄)	Klarmann, Mädche
Exams					
ST 2024	7900048	<a href="#">Team Project Management and Technology</a>			Klarmann, Mädche
WT 24/25	7900207	<a href="#">Team Project Management and Technology</a>			Mädche, Klarmann

Legend: 📱 Online, 🔄 Blended (On-Site/Online), 📍 On-Site, ✕ Cancelled

### Competence Certificate

Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

T



## 8.250 Course: Team Project Management and Technology (BUS/ENG) [T-WIWI-110977]





**Responsible:** Prof. Dr. Martin Klarmann  
Prof. Dr. Alexander Mädche

**Organisation:** KIT Department of Economics and Management

**Part of:** [M-WIWI-105447 - Team Project Management and Technology \(BUS/ENG\)](#)

Type	Credits	Grading scale	Recurrence	Expansion	Version
Examination of another type	9	Grade to a third	Each term	1 terms	1

Events					
ST 2024	2571176	<a href="#">Teamprojekt Wirtschaft und Technologie</a>		Project (P / 	Klarmann, Mädche
WT 24/25	2571176	<a href="#">Team Project Management and Technology</a>	6 SWS	Project (P / 	Klarmann, Mädche
Exams					
ST 2024	7900050	<a href="#">Team Project Management and Technology (BUS/ENG)</a>			Klarmann, Mädche
WT 24/25	7900208	<a href="#">Team Project Management and Technology (BUS/ENG)</a>			Mädche, Klarmann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate


Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.





## T

## 8.251 Course: Tires and Wheel Development for Passenger Cars [T-MACH-102207]

**Responsible:** Prof. Dr.-Ing. Günter Leister  
**Organisation:** KIT Department of Mechanical Engineering  
**Part of:** [M-MACH-101265 - Vehicle Development](#)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each summer term	1

Events					
ST 2024	2114845	<a href="#">Tires and Wheel Development for Passenger Cars</a>	2 SWS	Lecture / 	Leister
Exams					
ST 2024	76-T-MACH-102207	<a href="#">Tires and Wheel Development for Passenger Cars</a>			Leister
WT 24/25	76-T-MACH-102207	<a href="#">Tires and Wheel Development for Passenger Cars</a>			Leister

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

### Competence Certificate

Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

### Prerequisites

none

Below you will find excerpts from events related to this course:

## V

### Tires and Wheel Development for Passenger Cars

2114845, SS 2024, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)  
On-Site

### Content

1. The role of the tires and wheels in a vehicle
2. Geometrie of Wheel and tire, Package, load capacity and endurance, Book of requirement
3. Mobility strategy, Minispare, runflat systems and repair kit.
4. Project management: Costs, weight, planning, documentation
5. Tire testing and tire properties
6. Wheel technology including Design and manufacturing methods, Wheeltesting
7. Tire pressure: Indirect and direct measuring systems
8. Tire testing subjective and objective

Learning Objectives:

The students are informed about the interactions of tires, wheels and chassis. They have an overview of the processes regarding the tire and wheel development. They have knowledge of the physical relationships.

### Organizational issues

Voraussichtliche Termine, nähere Informationen und eventuelle Terminänderungen:  
siehe Institutshomepage.

### Literature

Manuskript zur Vorlesung

Manuscript to the lecture



T

## 8.252 Course: Topics in Human Resource Management [T-WIWI-111858]

**Responsible:** Prof. Dr. Petra Nieken**Organisation:** KIT Department of Economics and Management**Part of:** [M-WIWI-105928 - HR Management & Digital Workplace](#)  
[M-WIWI-106860 - Leadership & Sustainable HR-Management](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
ST 2024	2573015	<a href="#">Topics in Human Resource Management</a>	2 SWS	Colloquium (K/📍)	Nieken, Mitarbeiter
WT 24/25	2573015	<a href="#">Topics in Human Resource Management</a>	2 SWS	Colloquium (K/📍)	Nieken

Legend: 📺 Online, 🔄 Blended (On-Site/Online), 📍 On-Site, ✕ Cancelled

**Competence Certificate**

Alternative exam assessment.

The grade is made up of the presentation of a given research topic and active participation in the discussions in the course. The weighting depends on the course and will be announced at the beginning of the course.

**Prerequisites**

This course cannot be combined with T-WIWI-102871 "Problem Solving, Communication and Leadership".

**Recommendation**

We recommend visiting the course "Human Resource Management" before taking this course.

The course is strongly recommended for students interested in empirical research in the areas HRM, personnel economics, and leadership.

Below you will find excerpts from events related to this course:

V

**Topics in Human Resource Management**2573015, SS 2024, 2 SWS, Language: German, [Open in study portal](#)Colloquium (KOL)  
On-Site

**Content**

The students will discuss and analyze selected research papers in the areas HRM, personnel economics, and leadership. The students will present research papers and discuss research methods and designs as well as content.

**Aim**

The student

- Looks into current research topics in the areas HRM, personnel economics, and leadership.
- Analyzes research papers in detail and evaluates the research outcomes.
- Trains their presentation skills.
- Learns to critically evaluate research methods and trains the scientific discussion culture.
- Gains deeper knowledge in the area of HRM.
- Learns to evaluate research designs and takes into account the ethical dimension of research.

**Notes**

Due to the interactive nature of the course, the number of participants is limited. If you are interested, please contact Prof. Nieken by email.

**Workload**

The total workload for this course is approximately 90 hours.

Lecture: 30 hours

Preparation: 45 hours

Exam preparation: 15 hours

**Literature**

Selected research papers

**Organizational issues**

Geb. 05.20, Raum 2A-12.1

**Topics in Human Resource Management**

2573015, WS 24/25, 2 SWS, Language: German, [Open in study portal](#)

Colloquium (KOL)  
On-Site

**Content**

The students will discuss and analyze selected research papers in the areas HRM, personnel economics, and leadership. The students will present research papers and discuss research methods and designs as well as content.

**Aim**

The student

- Looks into current research topics in the areas HRM, personnel economics, and leadership.
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**Workload**

The total workload for this course is approximately 90 hours.

Lecture: 30 hours

Preparation: 45 hours

Exam preparation: 15 hours

**Literature**


Selected research papers





**Organizational issues**

Die Veranstaltung findet als Blockveranstaltung statt. Termine werden noch bekannt gegeben.

T

**8.253 Course: Virtual Reality Practical Course [T-MACH-102149]****Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)**Type**  
Examination of another type**Credits**  
4**Grading scale**  
Grade to a third**Recurrence**  
Each term**Version**  
2

Events					
WT 24/25	2123375	<a href="#">Virtual Reality Practical Course</a>	3 SWS	Project (P / 	Ovtcharova, Häfner
Exams					
ST 2024	76-T-MACH-102149	<a href="#">Virtual Reality Practical Course</a>	Ovtcharova, Häfner		

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Assessment of another type (graded)

**Prerequisites**

None

**Annotation**

Number of participants is limited

*Below you will find excerpts from events related to this course:*

V

**Virtual Reality Practical Course**2123375, WS 24/25, 3 SWS, Language: German/English, [Open in study portal](#)**Project (PRO)  
On-Site****Content**

- Introduction in Virtual Reality (hardware, software, applications)
- Exercises in the task specific software systems
- Autonomous project work in the area of Virtual Reality in small groups

**Literature**

Keine / None

T

**8.254 Course: Welfare Economics [T-WIWI-102610]**

**Responsible:** Prof. Dr. Clemens Puppe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101501 - Economic Theory](#)

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	see Annotations	3

Exams			
ST 2024	7900257	<a href="#">Welfare Economics</a>	Puppe
ST 2024	7900373	<a href="#">Welfare Economics</a>	Puppe

**Competence Certificate**

The assessment consists of a written exam (60 min.).

**Prerequisites**

The course *Economics I: Microeconomics* [2610012] has to be completed beforehand.

**Recommendation**

None

**Annotation**

The course only takes place every second summer semester, the next course is planned for summer semester 2025.

T


**8.255 Course: Workshop Mechatronical Systems and Products (mach/etit/wiwi) [T-MACH-112648]**





**Responsible:** Prof. Dr.-Ing. Sören Hohmann  
Prof. Dr.-Ing. Sven Matthiesen

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-106236 - Mechatronic Product Design](#)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	5	Grade to a third	Each winter term	1

Events					
WT 24/25	2145162	<a href="#">Workshop Mechatronical Systems and Products</a>	2 SWS	Practical course / 	Matthiesen, Hohmann, Teltschik

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**Prerequisites**

None